



United States
Department of
Agriculture

Forest
Service



May 2015

Draft Record of Decision for Invasive Plant Management for the Medicine Bow - Routt National Forests and Thunder Basin National Grassland

Garfield, Grand, Jackson, Moffat, Rio Blanco, and Routt
Counties, Colorado
Albany, Campbell, Carbon, Converse, Natrona, and Platte
Counties, Wyoming



Cheatgrass infestation on the Medicine Bow-Routt National Forest

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDAs TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202)720-6382 (TDD). USDA is an equal opportunity provider and employer.

Table of Contents

Summary	1
My Decision	2
Integrated Pest Management	3
Adaptive Management Strategy	4
Rationale and Effects of Decision	5
Short-term Uses and Long-term Productivity	11
Unavoidable Adverse Effects	11
Irreversible and Irretrievable Commitments of Resources	12
Meeting Existing Law, Regulation, and Agency Policy for Treating Non-native and Invasive Plants	12
Other Alternatives Considered	14
Alternatives Considered but Eliminated from Detailed Study	17
Environmentally Preferable Alternative	18
Public Involvement	18
Other Required Disclosures	19
Attachment 1 – Resource Protection Measures to be Implemented Under My Decision	22
Protection Measures for Federally Listed Species	22
Protection Measures for Federally Listed Plant Species	26
Protection Measures by Activity	31
General Protection Measures by Resource	41
Herbicide-specific Resource Protection for Environmentally Sensitive Zones	42

DRAFT Record of Decision
for
Invasive Plant Management for the Medicine Bow - Routt
National Forests and Thunder Basin National Grassland
USDA Forest Service

Garfield, Grand, Jackson, Moffat, Rio Blanco, and Routt Counties, Colorado
Albany, Campbell, Carbon, Converse, Natrona, and Platte Counties, Wyoming

Summary

This draft Record of Decision (ROD) documents my decision to select alternative 2 – the preferred alternative – to treat invasive plant species on the Medicine Bow-Routt National Forests and Thunder Basin National Grassland (MBRTB) using an adaptive and integrated invasive plant treatment strategy. The rationale behind the decision is based on, and supported by, the *Invasive Plant Management Final Environmental Impact Statement for the Medicine Bow-Routt National Forests and Thunder Basin National Grassland* (April 2015).

Alternative 2 authorizes annual treatment of 3,000 – 8,000 acres of invasive plant species using a combination of manual treatments, mechanical treatments, biological treatments, cultural treatments,¹ and aerial and ground herbicide applications; treatments will be implemented over the next fifteen years. Potential treatment areas include, but are not limited to, crucial big game winter ranges and other important habitats, fuels reduction projects, roads and trails, power lines, areas of timber harvest, and beetle-killed forests where invasive plant species have already begun to proliferate. Implementing the preferred alternative will require compliance with herbicide label restrictions and comprehensive resource protection measures.

Alternative 2 broadens current management to do the following:

- Treat infestations through adaptive management tools for assessing new treatments and new sites.
- Treat invasive species in addition to those listed as noxious farm weeds by the states of Colorado and Wyoming.
- Allow the use of new, more species-specific, EPA-registered herbicides. A Forest Service assessment team will be established to review the EPA-issued registration eligibility decision and determine the new herbicide's appropriateness for use on public lands.
- Broaden control methods to include the use of aerial application of herbicides in limited or specific circumstance; for example, large infestations of weeds in inaccessible or remote areas and infestations in areas of critical habitat where ground application cannot be done safely or effectively.
- Broaden protection measures for ground and aerial applications of herbicides.

¹ Examples of cultural treatments are seeding native plants, grazing, and use of fertilizer.

The areas affected by the project are the Medicine Bow National Forest, the Routt National Forest, and the Thunder Basin National Grassland. The Medicine Bow National Forest includes 1,095,386 acres of national forest system (NFS) land in five Wyoming counties: Albany, Carbon, Converse, Natrona, and Platte. The Routt National Forest is located in northwestern Colorado occupying 1,125,568 acres of NFS land in Garfield, Grand, Jackson, Moffat, Rio Blanco, and Routt counties, Colorado. The Thunder Basin National Grassland is located in northeastern Wyoming and occupies about 553,300 acres of NFS land among a mosaic of state, federal, and private lands in Campbell, Converse, Crook, Niobrara, and Weston counties.

New direction for invasive plant management on the MBRTB is needed for the following reasons:

- To meet existing law, regulation, and agency policy directing the Forest Service to treat non-native and invasive plants.
- To update existing management direction to include new invasive species and new treatments.
- To make cooperative treatment and control of invasive plant species more consistent and effective across land ownership boundaries. Without an adequate plan for lands managed by the MBRTB, invasive species control efforts on adjacent lands under other federal, state, and private ownership may not be effective.
- To help meet or maintain desired resource conditions on the MBRTB. Invasive plants are threatening or dominating areas of both forests and the grassland with resulting impacts to native plant communities, soil, watershed function, wildlife habitats, forage areas for wildlife and livestock, and recreational and scenic values.

My Decision

Based upon my review of the alternatives analyzed in the *Invasive Plant Management Final Environmental Impact Statement* (FEIS), I have decided to implement alternative 2 – the preferred alternative. This alternative allows for ground and aerial application of herbicides to treat invasive plant species in Colorado and Wyoming and, when compared to the other alternatives, best meets the purpose and need by including new invasive plant species and new treatment methods. It also improves my ability to work with other federal agencies, state agencies, county entities, and private land owners to complete cooperative treatments and control of invasive plant species across land ownership boundaries, particularly with the use of aerial herbicide application.

My decision expands current invasive plant management to include the following:

- Treatment of invasive species in addition to those listed as noxious farm weeds by the states of Colorado and Wyoming.
- Use of new, more species-specific, EPA-registered herbicides. An MBRTB assessment team will review the EPA's registration eligibility decision for new herbicides and determine if the herbicides are appropriate for use on the forests and grassland.
- Aerial herbicide application.

- Protection measures not included in the present weed management program (the no action alternative). This includes protection measures for ground-based and aerial herbicide application. See appendix A of the FEIS for the protection measures that are part of my decision.

Fourteen herbicides are currently available for use under my decision: aminopyralid, chlorsulfuron, clopyralid, dicamba, fluroxypyr, glyphosate, hexazinone, imazapic, imazapyr, metsulfuron methyl, picloram, sulfometuron methyl, triclopyr, and 2,4-D. All are EPA-registered and have Syracuse Environmental Research Associates (SERA) risk assessments. Appendix B of the FEIS and the risk assessments in the project record contain additional information on these herbicides. As noted above, my decision also allows the use of new, more species-specific, EPA-registered herbicides as they become available.

My decision authorizes annual treatment of approximately 3,000 and 8,000 acres over the next fifteen years. This includes an estimated 1,000 to 5,000 acres that could be treated using aerial application of herbicides. Aerial treatment would primarily target cheatgrass, and the herbicide initially proposed for use is imazapic.

Integrated Pest Management

Integrated pest management is a key part of my decision. It utilizes the tools listed below, either alone or in combination, to treat invasive plant species.

- Mechanical treatment, such as hand-pulling, grubbing, mowing or cutting.
- Revegetation, where competitive vegetation is seeded to reduce invasive species, possibly after other treatments.
- Grazing with livestock. This includes targeted grazing with sheep, goats, or cattle through a contract and targeted grazing with livestock permitted to graze on the MBRTB under a term or temporary grazing permit or agreement.
- Biological control through the use of predators and parasites (for weed suppression, this primarily refers to insects) or plant pathogens (e.g., fungi, bacteria, viruses). Insects (gall fly, weevils, and beetles) are the only biological control currently in use on the MBRTB.
- Herbicide control using ground-based application methods.
- Herbicide control using aerial application methods.
- Prescribed fire in conjunction with other treatment methods.
- Education to inform people of the effects of invasive plant infestations, methods of spread, and preventative management opportunities and practices.
- Prevention practices that reduce invasive plant spread, including a weed-free forage program and washing vehicles to remove seeds.

With the exception of aerial herbicide application, all of these integrated pest management treatment and prevention methods are part of the current weed management program (the no action alternative).

My decision does not choose one treatment tool over another but rather selects a combination of tools that would be most effective on target species for a particular location. Reliance on one

method or restricting use of one or more tools may prove less effective. Effectiveness and applicability of each tool vary and depend on invasive plant biology and ecology, location and size of the infestation, environmental factors, management objectives, and management costs. Appendix C of the FEIS identifies example treatments for target invasive plant species using the treatment methods listed above.

My decision will use the strategy outlined in table 3 in the FEIS to help select the most appropriate and effective control method. However, based on site-specific conditions and circumstances, strategies may change. Following EPA labels and APHIS direction (for biological control agents) and implementing resource protection measures will ensure that treatment methods are properly used.

Adaptive Management Strategy

My decision also includes the concept of adaptive management to deal with infestations that are constantly changing. Adaptive management offers a way to describe and evaluate the consequences of changing or new infestations and new treatment options while still addressing other resource concerns.

The adaptive management strategy consists of two principle components:

1. Use of a decision tree (see figure 2 in the FEIS) to select methods to quickly and effectively treat new infestations. The decision tree is based on infestation size, location, site characteristics, and consultation with specialists.
2. Evaluation of new technology, biological controls, or herbicides to improve treatment effectiveness and reduce impacts.

New technology, biological controls, herbicide formulations, and supplemental labels are likely to be developed within the life of this project. New treatments will be considered if they are more species-specific than methods currently used, less toxic to non-target vegetation and other organisms, less persistent and less mobile in the soil, or more effective. An adaptive management strategy allows use of new treatment methods if they meet the following criteria:

- The new or existing herbicide must have an EPA-approved herbicide label. Application must adhere to label specifications.
- An MBRTB assessment team will review the EPA's registration eligibility decision for new herbicides and determine if the herbicides are appropriate for use on the forests and grassland.
- New biological agents must be detrimental to the target plants and virtually harmless to native or desirable non-native plants.
- New biological agents must be approved by USDA Animal, Plant Health Inspection Service (APHIS) and the states of Colorado and Wyoming prior to their introduction.
- An FSH 1909.15, 18.4 (Section 18) review will be conducted to determine if the effects of the new or existing herbicide are consistent with those identified in this project.
- Mechanical methods of treatments must be cost effective. These methods will be reviewed before use to determine if other resource quality standards can be maintained.

Rationale and Effects of Decision

I have reviewed the FEIS and the project record, including the forest plan. I am familiar with the scope of the project area and I understand the resource and human impacts of selecting the preferred alternative – alternative 2.

I decided to implement alternative 2 for the following reasons:

- It enables the MBRTB to effectively treat non-native and invasive plants as required by existing law, regulation, and Forest Service policy, and it is consistent with the forest and grassland plans.
- It updates existing management direction to include new treatment methods and treatment of new invasive species that cannot be treated under the existing 1986 direction.
- It makes cooperative treatment and control of invasive plant species more consistent and effective across land ownership boundaries. Without an adequate plan for lands managed by the MBRTB, invasive species control efforts on adjacent lands under other federal, state, and private ownership may not be effective.
- It helps meet or maintain desired resource conditions on the MBRTB, including limiting the spread of invasive plants into areas with little or no infestation to help reduce fire hazard and/or risk. Invasive plants are threatening or dominating areas of both forests and the grassland with resulting impacts to native plant communities, soil, watershed function, wildlife habitats, foraging areas for domestic livestock, and recreational and scenic values.

In making my decision, I also considered the following issues identified by the public and resource concerns identified by the interdisciplinary team.

ISSUE #1: Effects on native vegetation, biological diversity, production, and structure.

My decision protects native plant communities by improving the efficiency of invasive plant treatment and increases the number and acres of invasive plants that can be treated. In particular, it addresses the proliferation of cheatgrass documented on the MBRTB since 2000.

I recognize that all of the herbicides considered for use are likely to kill or damage some native plant species immediately adjacent to, or interspersed with, target weed species. However, negative effects to native plants can be reduced by selecting the appropriate herbicide application method, rate, timing, and surfactant. My decision includes the laws, regulations, standards, and guidelines that apply to herbicide use, as well as the protection measures listed in attachment 1, to minimize negative effects to native plant communities and other resources.

My decision allows aerial herbicide application which is most likely to affect non-target native plants because this method applies herbicide to all plants in the treatment area, and drift can affect plants outside the treatment area. Protection measures in Attachment 1 will minimize the risk of drift, and recent advances in computer-controlled aerial application technology allow more precise application in terms of the area where the herbicide is applied and the application rate.

ISSUE #2: Effects of herbicides on threatened, endangered, or sensitive species and their habitats.

Plant Species: Alternative 2 resulted in a biological determination of *‘may affect, not likely to adversely affect’* for Ute ladies’-tresses (**threatened**). However, as discussed in the biological assessment, effects are expected to be insignificant (immeasurable, and would not reach the level of take) or discountable (extremely unlikely to occur) due to the protection measures associated with this alternative (draft ROD, Attachment 1).

My decision resulted in a biological determination of *‘may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing’* for most sensitive plant species. Despite this determination, some species received a *‘beneficial impact’* determination, as follows: Barr’s milkvetch; dropleaf buckwheat; Harrington’s beardtongue; Hall’s fescue; Colorado tansyaster; rock cinquefoil; common twinpod; and Visher’s buckwheat. These communities would be widely treated for the control of cheatgrass, which could make significant long-term improvements in their habitats.

Wildlife Species: No direct effects to Canada lynx (**threatened**) are anticipated. Although the treatments may have some indirect effects to habitat for lynx and their prey, the treatments may reasonably be considered as insignificant when compared proportionally to the habitat available. Based on these effects, SRLA guidance, long-term benefits, and protection measures associated with this project, my decision results in a *‘may affect, but not likely to adversely affect’* determination for Canada lynx.

Some components of my decision may adversely impact Preble’s meadow jumping mouse (**threatened**), thus the determination for this species is *‘may affect, likely to adversely affect.’* Because this species has small populations with low habitat connectivity and limited mobility, all of the invasive treatment options, except the use of biocontrol, could result in adverse impacts. The protection measures in attachment 1 include requirements for pre-treatment surveys, timing limitations, and selection of treatment options to help mitigate adverse effects. In their biological opinion, the U.S. Fish and Wildlife Service rendered a jeopardy opinion for the Preble’s meadow jumping mouse. The biological opinion included a take permit which will allow me to implement my decision in Preble’s habitat.

For **Region 2 sensitive species**, my decision results in a determination of *‘may adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing.’* This determination applies to the following species: swift fox, northern harrier, ferruginous hawk, bald eagle, loggerhead shrike, burrowing owl, short-eared owl, black-tailed prairie dog, Rocky Mountain bighorn sheep, Greater sage-grouse, Brewer’s sparrow, grasshopper sparrow, sage sparrow, mountain plover, chestnut-collared longspur, and McCown’s longspur. In selecting alternative 2, I considered the short-term impacts from disturbance associated with herbicide application (ground/aerial) as well as the long-term beneficial impacts by improving forage and habitat and reducing potential disturbance from fire.

ISSUE #3: Effects of herbicides on soils, water, and aquatic resources.

Alternative 2 is expected to have a beneficial effect on soils in the project area by increasing groundcover and reducing surface erosion. Under my decision, invasive species populations

would decrease and native plant populations would increase. Native plants generally provide more effective groundcover than invasive plants, and more effective groundcover reduces surface erosion. Reduced surface erosion benefits soil and aquatic ecosystems.

I recognize that the herbicide use in my decision has the potential to affect soil microorganisms, water quality, and aquatic organisms. However, I am confident that the resource protection measures (see attachment 1) in my decision will reduce or prevent potential effects of herbicide use on these features. There are general measures to prevent the potential contamination of waterways and wetlands; protection measures specific to water resources; protection measures for wildlife/aquatics and water and woodlands; and protection measures for environmentally sensitive areas. My decision also includes a 300-foot buffer on each side of aquatic, streamside, or wetland areas and multiple measures designed to reduce spray drift for aerial herbicide application and resource protection measures requiring a surface water quality risk assessment during the contract preparation for aerial application of herbicides, adding another layer of protection for surface water.

ISSUE #4: Effects of herbicides on human health.

I considered potential health risks to herbicide applicators (workers), to the public, and to those who are more sensitive to chemical exposure. As discussed in the FEIS, no significant human health effects are anticipated from manual or mechanical removal of weeds because required PPE (gloves, long-sleeved shirts, long pants, boots and safety glasses) and proper washing of contaminated PPE would prevent injuries or irritation.

I am familiar with the risk assessments, prepared by Syracuse Environmental Research Associates (SERA), for the herbicides that could be used under my decision. Based on my review of the FEIS and the human health report, I note the following potential effects:

- The following five herbicides have estimated chronic² and acute³ exposures less than EPA's reference dose (RfDs)⁴ which means there is little risk to workers or the public from exposure: aminopyralid, imazapyr, metsulfuron methyl, sulfometuron methyl, and chlorsulfuron.
- Nine herbicides exceed the RfDs for chronic or acute exposure for the public or workers or both. In particular, workers applying hexazinone, triclopyr, or 2,4-D could be exposed to doses in excess of the RfDs, making the requirements for PPE and proper handling of contaminated PPE particularly important.
- **Groups or Individuals with Chemical Sensitivities:** For nine herbicides, the SERA risk assessments did not indicate information to suggest specific groups or individuals would be especially sensitive to systemic effects; however, data in humans is lacking. For the remaining five herbicides, potential effects to sensitive subgroups are summarized below:

² The term *chronic* refers to longer term exposure; for example, exposure that occurs with multiple herbicide applications over time.

³ In *acute* exposures, the dose is delivered in a single event, and absorption is rapid. In the SERA risk assessments, the acute exposure scenarios are primarily accidental.

⁴ A reference dose (RfD) is a dose the EPA estimates to be without an appreciable risk of adverse effects over a lifetime of daily exposure.

- 2,4-D disrupts cells at the level of the membrane and basic metabolic function. Individuals with diseases that compromise cell integrity (e.g., sickle cell anemia) may be more sensitive to exposure (SERA 2006).
- The only identified sensitive subgroup for dicamba appears to be children. SERA evaluated effects to children in their assessment of effects to the general public so children were not evaluated separately as a sensitive subgroup.
- The most sensitive subgroup for exposure to glyphosate and glyphosate formulations appears to be pregnant women and the developing fetus. The highest hazard quotient (HQ) was calculated for consumption of contaminated water after an accidental spill. In this scenario, the HQ reached the level of concern – HQ = 1 – but did not exceed it (SERA 2011a).
- The most sensitive subgroup for exposure to hexazinone appears to be pregnant women and the developing fetus. Laboratory studies on rats and rabbits showed kidney malformations and delayed bone development in rat offspring and delayed bone development in rabbit offspring (SERA 2005).
- There are no epidemiology studies linking exposure to triclopyr and adverse reproductive outcomes in humans; however, triclopyr is associated with adverse reproductive effects in rats and rabbits (SERA 2011c).

It is important to note the difference between EPA's reference dose and the exposure that is likely to occur from herbicide treatment of invasive plants on the MBRTB. A reference dose (RfD) is a dose the EPA estimates to be without an appreciable risk of adverse effects over a lifetime of daily exposure. On the MBRTB, the maximum a worker could conceivably apply herbicides would be 100 days in a given year over a career of 20 years, which is considerably less than a lifetime of daily exposure.

I recognize that there are potential health risks associated with herbicide use – both ground-based and aerial – under my decision. My selection of alternative 2 includes protection measures (see attachment 1) to minimize health risks to workers, the public, and sensitive subgroups.

Aerial spraying could expose the public to herbicide drift; however, this potential exposure would be reduced by following the herbicide label instructions and implementing the protection measures shown in attachment 1. Herbicide labels describe conditions in which ground or aerial spraying should not be done, and attachment 1 lists the protection measures for aerial herbicide application, including use of buffer zones and drift reduction agents and application restrictions for particular weather conditions.

My decision to allow aerial application of herbicides carries a higher risk of accidental spills and there is greater concern with storage, transport, and disposal because more acres are proposed for treatment so more herbicide would be used. To mitigate these potential effects, my decision includes direction outlined in Forest Service Handbook 2109.12 Pesticide Storage, Transportation, Spills and Disposal.

In contrast, my decision to allow aerial spraying poses less risk to workers because it reduces exposure to the herbicide. The person who mixes and loads the herbicide has less contact time and the pilot who applies it is protected by the enclosed cockpit of the helicopter/fixed-wing

aircraft. Because aerial herbicide application is more efficient than backpack or vehicle spraying for control of cheatgrass (Haas 2011), my decision could reduce the number of treatments and thus the likelihood of exposure over the long-term. It is estimated that a helicopter can spray about 200 acres per day (50 acres/hour x 4 hours of flight time). A person can hand treat about 2 acres per day under optimal conditions. At this application rate, multiple treatments would be necessary.

During the comment period for the DEIS, we received comments and a proposed alternative from a member of the public who owns property adjacent to the Medicine Bow National Forest. The comment letter notes that the individual and their family members have been diagnosed with chemical sensitivity. Given their condition, they have advocated for either the selection of alternative 4 with no herbicide use or for the establishment of an 8,020-acre herbicide exclusion zone on the forest to provide a buffer for their property.

I have reviewed the analysis of the proposed exclusion zone alternative presented in FEIS (chapter 2, *Alternatives Considered but Eliminated from Detailed Study*). I did not select this alternative because it is not consistent with purpose and need of meeting existing law, regulation, and agency policy for treating non-native and invasive plants. The area in question has existing infestations of Dalmation toadflax, ox-eye daisy, cheatgrass, Canada thistle, musk thistle, and yellow toadflax.

Although I am not selecting the proposed alternative, my decision includes protection measures to address their concerns above and beyond those contained in attachment 1. These include:

- Notify the family 24 hours in advance before ground spraying within 65 feet of their property. The twenty-four hours' notice is to maintain consistency with the notification requirements for the sensitivity registry maintained by the Colorado Department of Agriculture. Sixty-five feet is the recommended minimal buffer zone for aerial spraying applications in the Missoula Valley. Buffer zones for ground spraying are less than 65 feet (Felsot 2001).
- Notify the family 24 hours in advance before aerial spraying within 300 feet of their property. The twenty-four hours' notice is to maintain consistency with the notification requirements for the sensitivity registry maintained by the Colorado Department of Agriculture. Three hundred feet is the minimum buffer for aerial application around campgrounds, recreation residences, and private residential areas.

My decision also includes the following protection measure specific to chemically sensitive individuals in Colorado:

- Before spraying herbicides near residential areas, check the sensitivity registry maintained by the Colorado Department of Agriculture for a list of chemically sensitive individuals. Twenty-four hours prior to herbicide application, notify those individuals who are on the registry and have property abutting the treatment area. The registry is for people who have documentation of sensitivity to pesticide products from a licensed Colorado physician. The registry does not prevent application of pesticides but only requires that commercial applicators notify people on the registry 24 hours before an application is made to abutting property so they can leave for a period of time.

Based on my review of the potential human health effects disclosed in the FEIS, I am confident my decision contains the necessary protection measures to mitigate adverse impacts to workers, the public, and sensitive subgroups.

RESOURCE CONCERN #1: Effects on wilderness, recommended wilderness, inventoried roadless areas, wild and scenic rivers, and research natural areas.

My decision allows aerial treatment in designated wilderness only if necessary to protect native plant populations; it also includes a 300-foot buffer to protect streams, lakes, wetlands, and riparian areas. I recognize that aerial application of herbicides to treat cheatgrass could adversely impact opportunities for solitude; however, I expect these impacts will be minimal because most cheatgrass infestations are at lower elevations and most designated and recommended wilderness are at elevations above 9,000 feet.

My decision would have negligible effects on the outstandingly remarkable river values of the North Platte, Encampment, Red Canyon, Rock, and Little Snake eligible wild and scenic rivers. Because my decision includes the option of using newer, more selective, and more effective herbicides, it could reduce the potential adverse effects of invasive species introduction and spread from recreation activities in the river corridors.

My decision also allows for herbicide use in Special Interest Areas (SIAs) and Research Natural Areas (RNSs); however, it would be tightly controlled, and herbicides would only be used when deemed necessary by specialists from multiple disciplines and/or outside agencies. The aerial spraying option that is available under my decision is unlikely to be frequently used in these special emphasis areas. However, when it is used, it has the potential to effectively treat infestations before they threaten local vegetation on a large scale which may be vital to preserving native vegetation and high-value plant communities.

As disclosed in the FEIS, aerial spraying is not recommended in any SIA or RNA with high wetland cover or abundant sensitive species because spray buffers may be hard to administer and windy conditions may cause excessive herbicide drift. Aerial spraying is discouraged in the Kettle Lakes RNA which has occurrences of sensitive species and abundant kettle pond wetlands, ponds, and fens.

RESOURCE CONCERN #2: Effects on recreation users.

My decision includes ground-based and aerial application of herbicides which could result in a short-term loss of recreation opportunity if the treatments occur at the same time and place that visitors are recreating. My decision could also have a beneficial impact by reducing or eliminating invasive plants that impede travel, cause discomfort, or cause changes in the perceived environment.

Closures for chemical treatments would typically last less than 48 hours and might occur at a handful of sites each year. As an extreme example, if 25% of all the developed recreation sites on the MBRTB experienced a 48-hour closure for weed treatment every year, the result would be a less than 1% reduction in the quantity of recreation opportunities. My decision includes protection measures (see notification requirements and buffer zones in attachment 1) to mitigate adverse effects of herbicide application in public recreation areas.

RESOURCE CONCERN #3: Effects on social and economic considerations, including effects on partnerships/cooperators.

My decision will have a beneficial impact on the land and resource values in the analysis area. Alternative 2 includes more effective treatment options which would reduce the economic impacts of invasive species and help improve the quantity and quality of native vegetation. This would maintain and/or increase the value of the land and resources in the analysis area. Weeds would spread onto fewer adjacent and intermingled private and state acres.

I recognize that my decision may have short-term economic impacts as noxious and invasive plants begin to die off and native plant populations recover. Some areas may require additional, short-term expenditure to prevent or reduce the risk of erosion and to hasten the restoration of native plants, where appropriate. These impacts should decrease as native plant populations recover.

My decision would allow the MBRTB to continue building partnerships with federal, state and county agencies and cooperators such as grazing associations and oil and gas companies as part of an integrated invasive species and noxious weed treatment program.

Short-term Uses and Long-term Productivity

NEPA requires consideration of “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR 1502.16). As declared by Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

My decision may result in the short-term loss of non-target species and localized biodiversity in areas where herbicides, some mechanical treatment, and fire treatment methods are used. Grazing and some mechanical treatments may affect non-target species through temporary loss of biomass but these plants are generally not killed by these treatment actions. Biological agents are host-specific and do not have an effect on non-target species. In this analysis, the overall the long-term effect of all identified noxious weed treatments is increased biodiversity and restoration of the natural productivity through the eradication of noxious weeds.

Unavoidable Adverse Effects

Under my decision, herbicide treatments could have some unavoidable environmental impacts. Adverse effects would primarily involve localized, short-term impacts to non-target plants. Although it is possible that small amounts of herbicide could migrate from treatment sites, the resource protection measures in attachment 1 would prevent environmentally significant concentrations of herbicide from reaching surface or groundwater. Following label instructions and the use of prescribed personal protection equipment would protect applicators and the public from unacceptable exposure to herbicides and threats to human health.

Mechanical, biological, and cultural treatments under the selected alternative have no known unavoidable adverse effects. Thus, under reasonably foreseeable circumstances, there would be no significant environmental effects.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. My decision will not result in irreversible commitments of resources.

Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road.

My decision to select alternative 2 may result in some short-term irretrievable commitments of resources as some non-target species of vegetation could be affected by herbicide use in the short-term but would be regained in the long-term. These commitments would be localized and would not have significant effects on biodiversity, wildlife habitat, or forage production.

My decision would not cause an irretrievable commitment of resources involving threatened, endangered, proposed, or sensitive wildlife species or other wildlife species of concern. There could be short-term impacts from treatment options available under my decision; however, no long-term loss of plant species is predicted from herbicide applications, and native forb species reduced by herbicide applications are expected to recover within a few years after treatment and thrive after competition with invasive plants is reduced.

Meeting Existing Law, Regulation, and Agency Policy for Treating Non-native and Invasive Plants

My decision is consistent with law, regulation, and agency policy to treat non-native and invasive plants. Several laws and regulations specifically address control of such species.

- Carlson-Foley Act of 1968 (PL 90-583) authorizes and directs federal agencies to permit control of noxious weeds on federal lands by state and local governments on a reimbursement basis in connection with similar weed control programs carried out on adjacent nonfederal land.
- Federal Noxious Weed Act of 1974 (PL 93-629) defines weeds, and authorizes the Secretary of Agriculture to cooperate with other agencies, organizations, or individuals to control and prevent noxious weeds.
- The Federal Land Policy Management Act of 1976 (PL 94-579) authorizes control of weeds on rangeland.
- The National Forest Management Act of 1976 (PL-94-588) authorizes removal of deleterious plant growth through forest plans.
- The Wilderness Act of 1964, as amended (October, 1978). The management goal for wilderness areas is to retain their primitive character and influence, without permanent improvements or human habitation, so as to preserve natural condition.

- U.S. Forest Service Pesticide Use Management and Coordination Handbook (FSH 2109.14) provides Forest Service personnel with direction for proper use of, and containment and safety procedures for, pesticides.
- FSM 2100, Chapter 2150. Pesticide-Use Management and Coordination directs the Forest Service to plan, evaluate, and review pesticides and their use, as well as provide for safety in pesticide use, storage, transportation, and disposal.
- FSM 2900, Invasive Species Management lists laws and regulations for the Forest Service to adhere to. Additionally, the manual states that the Forest Service invasive species policy and management objectives will be based on integrated pest management.
- Code of Federal Regulations, 36 CFR 222.8 directs the Forest Service to cooperate with local weed control districts to analyze and develop noxious weed control programs where there are national forests and grasslands.
- Forest Service Manual 2259.03 states, “Forest officers shall cooperate fully with State, County and Federal officials in implementing 36 CFR 222.8 and Sections 1 and 2 of Public Law 90-583. Within budgetary constraints, the Forest Service shall control to the extent practical, noxious farm weeds on all NFS lands.”
- Colorado Noxious Weed Act of 1996 (C.R.C. Title 35-5.5) declares that undesirable plants that constitute a threat must be managed regardless of land ownership.
- Wyoming Weed and Pest Control Act of 1973 (W.S. 11-5-101-11-5-119), the purpose of which is to control designated weeds and pests regardless of land ownership.
- Wyoming Weed and Pest Special Management Program (W.S. 11-5-301-11-5-303) authorizes development of county weed and pest control districts and an “integrated management system” for planning and implementation of a coordinated program utilizing all proven methods of control.
- 1996 MBRTB Management of Noxious Weeds Environmental Assessment is in place for the control of weeds on the MBRTB by setting priorities, developing a prevention plan, continuing weed inventory, and implementing a noxious weed control program. Additional decisions that tier to these documents have been made for specific projects such as road and trail construction, coal mining, timber sales, grazing management, and special uses.
- Executive Order 13112 Invasive Species (64 FR 6183; February 8, 1999) directs federal agencies “to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.”

Direction and support for non-native and invasive plant species management is also provided in the following:

- The 1998 Forest Service Natural Resource Agenda placed a strong emphasis on conserving and restoring degraded ecosystems as a management priority for the 21st Century, including actions to “attain desirable plant communities and prevent exotic organisms from entering or spreading in the United States.”

- The 1998 Forest Service Strategy for Noxious and Non-native Invasive Plant Management provided a “roadmap into the future for preventing and controlling the spread of noxious weeds and non-native invasive plants.”
- The 2004 National Strategy and Implementation Plan for Invasive Species Management identifies the Forest Service as one of the lead agencies in the effort to control non-native and invasive plants. It provides long-term direction to reduce, minimize, or eliminate invasive species across all landscapes and ownerships by improving the management of invasive species using science-based technology, by emphasizing partnerships, and by increasing performance and accountability, as well as communication and education.

Other Alternatives Considered

I considered three other alternatives in addition to the alternative 2 – the preferred alternative. They are discussed below. A more detailed comparison of these alternatives can be found in the FEIS in chapter 2.

Under the no action alternative (alternative 1), the current weed management program would continue. Herbicides would only be applied using ground-based methods; aerial application would not be used.

Eleven herbicides identified in the 1996 MBRTB *Noxious Weed Management Environmental Assessment* would be available for routine weed control: chlorsulfuron, clopyralid, dicamba, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, sulfometuron methyl, triclopyr and 2,4-D. Six herbicides have not been used in the past and would not be used under this alternative: atrazine, bromacil, diuron, tebuthiuron, simazine, and mefluidide.

Integrated pest management – mechanical, cultural, biological, and chemical (herbicide) treatments – would continue. Adaptive management strategies would include the treatment of any newly introduced invasive plant species that are classified as noxious farm weeds by the states of Wyoming or Colorado, treatment of weed infestations in new areas, and use of new biological agents as they are approved by the USDA Animal and Plant Health Inspection Service (APHIS).

Alternative 1 would allow treatment of approximately 2,000-3,000 acres annually. Many of these acres are re-treatment acres, since some infestations require repeated treatment for 5 to 8 years to ensure effective control or provide containment.

I did not select alternative 1, the current weed management program, for the following reasons:

- The lack of aerial treatment limits the MBRTB’s opportunities to work with surrounding landowners for a landscape approach to invasive species management.
- It is less effective because it does not allow new herbicides, aerial application, and treatment of weed species not listed by Colorado or Wyoming.
- Few, if any, cheatgrass infestations would be treated because the MBRTB has no authorized selective herbicide to treat it, and aerial treatment is not an option. Many

native grasses and forbs eventually die out on a heavily infested cheatgrass site that remains untreated.

- The reduced ability to effectively treat invasive species, cheatgrass in particular, has the potential for adverse soil and water impacts. A monoculture of cheatgrass can also increase the incidence of wildfire and subsequent erosion and sedimentation which can degrade water quality and kill aquatic biota.
- Because new herbicides would not be available, the broad-spectrum herbicides glyphosate, hexazinone, and imazapyr may be used more frequently with greater potential damage to nontarget vegetation.
- Lack of effective treatment options may result in more acres of native plant communities becoming infested, with resulting, indirect adverse impacts on naturalness in wilderness and on scenic, wildlife, and fisheries values in wilderness, recommended wilderness, and eligible wild and scenic river corridors.
- Lack of effective treatment options may result in unchecked weed invasions which could cause vegetation shifts in some SIAs and RNAs. Changes in species composition and related effects on soils and fire regimes could compromise the utility of SIAs and RNAs for conservation, research, education, and as reference landscapes.
- Lack of effective treatment options would likely result in weeds spreading onto adjacent non NFS lands. The economic impacts of this invasive species spread could be reduced forage for livestock and wildlife, lower land values, and an inability to participate in, or maintain, effective weed control partnerships with adjacent landowners.
- Failure to effectively treat invasive species can make it more difficult for minerals and special uses permit holders to meet weed treatment terms and conditions in their permits.

Alternative 3 is the same as alternative 2, except that it would not include aerial herbicide application. Alternative 3 allows treatment of approximately 2,000 – 3,000 acres per year on the MBRTB using a combination of ground-based herbicide application plus manual, mechanical, biological, and cultural control methods. The integrated and adaptive management strategies for the preferred alternative would also be available.

I did not select alternative 3 for the following reasons:

- Without the option of aerial application, alternative 3 would treat a very small percentage of the estimated 97,000 cheatgrass-infested acres on the MBRTB.
- Lack of aerial treatment under this alternative limits our opportunities to work with surrounding landowners for a landscape approach to invasive species management.
- Lack of effective cheatgrass management has the potential to negatively affect soil, water quality, and aquatic organisms due to wildfire as discussed under alternative 1.
- Less effective control increases the chance that invasive species would invade suitable habitat for Ute ladies'-tresses and Preble's meadow jumping mouse.
- Expansion of cheatgrass constitutes a high risk for the persistence of Barr's milkvetch, dropleaf buckwheat, Harrington's beardtongue, Hall's fescue, Colorado tansyaster, rock cinquefoil, common twinpod, and Visser's buckwheat, and other rare plant species.

Under alternative 4, no herbicides would be used. The adaptive and integrated management strategies described below would apply. New and existing weed species and infestations could be treated as encountered under this alternative, and any newly approved biological controls could be used.

Integrated pest management:

- Mechanical treatment, such as hand-pulling, grubbing, mowing, or cutting.
- Revegetation, where competitive vegetation is seeded to reduce invasive species, possibly after other treatments.
- Grazing with livestock. This includes targeted grazing with sheep, goats, or cattle through a contract and targeted grazing with livestock permitted to graze on the MBRTB under a term or temporary grazing permit or agreement.
- Biological control through the use of predators and parasites (for weed suppression, this primarily refers to insects) or plant pathogens (e.g., fungi, bacteria, viruses). Insects (gall fly, weevils, and beetles) are the only biological control currently in use on the MBRTB
- Prescribed fire in conjunction with other treatment methods.
- Education to inform people of the effects of invasive plant infestations, methods of spread, and preventative management opportunities and practices.
- Prevention practices that reduce invasive plant spread, including a weed-free forage program and washing vehicles to remove seeds.

Adaptive management strategies:

- Use of a decision tree (see figure 2) to select treatment methods to quickly and effectively treat new infestations. The decision tree is based on infestation size, location, site characteristics, and consultation with specialists.
- Evaluation of new technology and biological controls to improve treatment effectiveness and reduce impacts.
- New biological agents must be detrimental to the target plants and virtually harmless to native or desirable non-native plants. New biological agents must be approved by USDA Animal, Plant Health Inspection Service (APHIS) and the states of Colorado and Wyoming prior to their introduction.

I did not select alternative 4 because it is not a viable alternative for the following reasons:

- It does not meet the purpose and need for the project.
- It is not consistent with the with the following guidelines in the *Thunder Basin National Grassland Land and Resource Management Plan - Northern Great Plains Management Plans Revision, July 2002*:

J. Noxious Weeds, Non-native, and Invasive Species

1. Manage invasive plant species using integrated management techniques, including mechanical, chemical, and biological control methods. Guideline
6. Utilize all methods feasible, including livestock grazing strategies in the integrated pest management program. Guideline

Alternatives Considered but Eliminated from Detailed Study

I considered other alternatives for treatment of invasive plant species. They are listed below with a summary of the rationale for eliminating them from detailed consideration. The detailed descriptions and reasons for their elimination can be found in chapter 2 of the FEIS.

Exclude an area of approximately 8,020 acres from ground or aerial herbicide application.

The intent of this alternative is to provide a buffer for three individuals with sensitivity to chemical agents. The property being buffered is in the Centennial Valley at T14N, R77W, sections 7 and 18. This alternative was eliminated from detailed analysis because excluding more than 8,000 acres from treatment is not consistent with purpose and need of meeting existing law, regulation, and agency policy for treating non-native and invasive plants. The Forest Service is directed by law, regulation, and agency policy to treat non-native and invasive plants, and the proposed exclusion zone includes infestations of Dalmatian toadflax, oxeye daisy, cheatgrass, Canada thistle, musk thistle, and yellow toadflax.

The proposed herbicide exclusion zone also includes about 1,250 acres of crucial deer and elk winter range. These acres are vulnerable to cheatgrass infestation following a wildfire because of site characteristics and the proximity of a large reservoir of cheatgrass seed. Failure to effectively treat cheatgrass would reduce the value of the area for wintering big game species. This is not consistent with forest plan management area direction which states, "Focus vegetation management on meeting wildlife winter range habitat objectives." (Medicine Bow forest plan, chapter 2, vegetation standard 2)

Prohibit all activities that spread invasive plants.

The intent of this alternative is to address and take action on human activities that promote the spread of weeds. The alternative proposed closing roads; modifying authorized livestock grazing permits; and altering or eliminating existing timber, mining, and recreational OHV activities. These human uses and activities are authorized in the records of decision for three land and resource management plans. The three plans meet the requirements of several public land laws and regulations authorizing multiple uses on NFS lands. Taking action on activities previously authorized under existing laws, regulations, permits, and the three land and resource management plans is beyond the scope of this EIS; this alternative was not considered further.

No invasive plant management treatments.

An alternative that discontinues the current weed management program was considered but eliminated from detailed analysis because it does not meet any of the project purposes or needs. It does not comply with the MBRTB's integrated pest management program, is inconsistent with Forest Service policy that noxious weeds and their adverse effects be managed on NFS lands, and it violates federal and state laws and executive orders.

Use herbicides only after other treatment methods have failed.

This alternative was eliminated because of the concern that if the non-herbicide treatments fail and some time passes before this failure is determined, the weed infestation may expand well beyond the original acreage and further impact forest resources. The resulting need for follow-

up treatments would then have greater potential impacts than the original action. Such an occurrence would not meet the project purpose and need.

Climate change and global warming effects on resource conditions

This alternative was eliminated from further consideration because current science is insufficient to determine a cause-and-effect relationship between climate change and invasive plant management treatments. The preponderance of current literature suggests that “most of the important elements of global change are likely to increase the prevalence of biological invaders” (Dukes and Mooney 1999). Ziska and others (2010) noted the potential for increased spread of invasive species in response to rising CO₂ levels, increasing surface temperature and the likely instability of weather and precipitation patterns. Kerns and Guo (2012) reported the increased likelihood of invasive species spread from increases in temperatures, precipitation changes, increased ecosystem disturbances, increased competitiveness due to elevated CO₂ levels, and increased stress on native species and ecosystems.

There is no way to quantify increases or decreases in CO₂ between the alternative 2 which treats the maximum acres of invasive species and alternative 4 which treats the minimum. Similarly, not enough research has been conducted on invasive species to know which species will respond positively or negatively to increases in CO₂.

Recommended management responses to these predictions are early detection (resulting from regularly scheduled monitoring) followed by a rapid response to eradicate initial infestations (Hellmann et al. 2008, Joyce et al. 2008, Tausch 2008, Kerns and Guo 2012). Early detection and rapid response are included in the all four alternatives.

Environmentally Preferable Alternative

Alternative 2 is the environmentally preferred alternative. While there are some direct and indirect effects to several resources, this alternative provides the most effective means to maintain and restore native vegetation which has long-term beneficial effects for most resources.

Public Involvement

The project was listed in the forest-wide schedule of proposed actions (SOPA) for the Medicine Bow-Routt National Forests in October 2009. The notice of intent (NOI) was published in the Federal Register on December 1, 2010 which started a 45-day comment period. The agency sent out over 500 scoping letters to individuals, businesses, organizations, and tribes that have expressed an interest in the project development process. Written comments were received from 24 respondents: members of the public, local and state agencies, and other and federal agencies. The interdisciplinary team used the comments to develop a list of issues to be addressed.

Using the information gleaned from scoping comments, the agency developed three alternatives to the proposed action (alternative 2). Effects of implementing the proposed action and alternatives were analyzed and disclosed in the draft EIS (DEIS). The analysis focused on effects to the issues and resource concerns described under the ‘Rationale and Effects of Decision’ section of this draft ROD.

The DEIS was released on March 21, 2014 which started the 45-day comment period. The comment period ended on May 7, 2014. We received comments from sixteen individuals, agencies, and organizations. Appendix E of the FEIS lists the comments and the agency responses.

Other Required Disclosures

Another aspect of the process of selecting an alternative is ensuring the planned actions comply with all legal requirements and policy. I have determined that implementation of alternative 2 is consistent with requirements of the laws and regulation listed below (also see FEIS chapter 1). My decision is also consistent with Environmental Protection Agency, Occupational Health and Safety Administration, state and federal water and air quality regulations, and Forest Service regulations (FSM 2080) regarding pesticide use and worker safety.

The National Forest Management Act (NFMA) 1976, which amends the Forest and Rangeland Renewable Resources Planning Act (RPS) of 1974: Alternative 2 was developed to be in full compliance and consistent with NFMA as summarized below:

Forest plan consistency: The forest and grassland plans, supported by their FEISs, are the programmatic documents required by the rules implementing the Forest and Rangeland Renewable Resources Act of 1974 (RPA), as amended by the National Forest Management Act of 1976 (NFMA). My decision is consistent with the forest and grassland plans in that planned activities will contribute to the forest and grassland plan goals and objectives listed below. Planned activities are also consistent with management area direction, and forest and grassland plan standards are followed.

- Minimize or reduce the spread of noxious weeds and nonnative invasive species and implement measures that minimize new introductions (MBR plan).
- Limit the proliferation of undesirable nonnative plant and animal species through various activities and practices (Routt plan).
- Within 10 years, limit further expansion of areas affected by noxious weeds (TBNG plan).
- Within 10 years, implement an integrated prevention and pest control management program for noxious weeds and undesirable non-native or invasive plant species (TBNG plan).

I have reviewed past monitoring and evaluation reports and Region 2 management indicator species (MIS) guidance for projects. The effects of planned activities on MIS are consistent with the forest and grassland plans. They are also consistent with the forest service manual (FSM) 2670 policy on sensitive species.

Alternative 2 is consistent with applicable forestwide threatened, endangered, sensitive species and wildlife standards and guidelines defined in the forest and grassland plans. The effects of my decision to implement alternative 2 are within the range of anticipated effects for each of the species as described in the environmental impact statements for the forest and grassland plans to which this analysis is tiered.

As disclosed in the FEIS, my decision is also consistent with forest and grassland plan standards and guidelines for rangeland vegetation; fish, wildlife, and rare plants; sensitive

plant and animal species; noxious weeds, non-native, and invasive species; water; wilderness, recommended wilderness, and eligible wild and scenic rivers; research natural areas and scenic integrity areas; recreation; and heritage resources.

The National Environmental Policy Act (NEPA) 1969: My decision and the analysis process documented in the FEIS comply with NEPA. Direction in 40 CFR parts 1500-1508 and FSH 1909.15 was followed throughout development of the FEIS and project as disclosed in the FEIS and project record.

The Endangered Species Act of 1973: My decision is consistent with the Endangered Species Act of 1973. Interagency cooperation between the Forest Service (or other federal agency) and the USFWS, regarding proposed, threatened, or endangered species, is described in Section 7 of the Endangered Species Act. Informal consultation and correspondence with USFWS concerning the invasive plant management EIS began January 5, 2011. The MBRTB forest supervisor sent a letter to both the Colorado and Wyoming Ecological Service's field offices requesting a list of threatened, endangered, proposed, and candidate species. This letter also requested that one field office be designated as the point of contact. The Wyoming Ecological Service's field office responded March 10, 2011 stating that the Wyoming office would be the lead for the project. The MBRTB biologists regularly coordinated with biologists at the Wyoming field office. A final biological assessment (BA) was submitted to the USFWS on February 6, 2014. On February 5, 2015, the MBRTB received a letter of concurrence for *not likely to adversely affect* determinations reached for threatened and endangered species in the BA as well as a biological opinion (BO) for the Preble's meadow jumping mouse due to the *likely to adversely affect* determination. Due to the incidental take statement in the BO for the Preble's meadow jumping mouse, the USFWS provided reasonable and prudent measures as well as terms and conditions that are incorporated into attachment 1 of my decision.

The National Historic Preservation Act of 1966: The Forest Service consulted with the Wyoming State Historic Preservation Office (SHPO) and the Colorado SHPO to ensure compliance with the National Historic Preservation Act of 1966, as amended in 1999. The terms found in the 2009 programmatic agreement (PA) between the Wyoming SHPO and the MBRTB allows for the application of pesticides that do not have the potential to affect access to or use of resources by Native Americans to be considered undertakings exempt from further review and/or consultation. Forest managers, planners and heritage staff do not have to notify or consult with SHPOs or other parties about these projects. Further, the PA also allows mowing treatment with a brush hog or similar rubber-tired equipment to be exempt from review and/or consultation unless managers, planners, or heritage staff has reason to believe that a specific undertaking may affect historic properties. A letter was sent to the Colorado SHPO informing them of the project; no further compliance or concurrence is needed.

The Clean Water Act of 1972 as amended in 1977: My decision to implement alternative 2 is consistent with this act through the application of the resource protection measures identified in attachment 1.

Executive Order 12898, issued in 1994, ordered federal agencies to identify and address the issues of environmental justice (i.e., adverse human health and environmental effects of agency programs that disproportionately impact minority and low income populations). I reviewed the environmental justice analysis conducted for this project and note that it determined

alternative 2 will not have a disproportional impact on minority or low income populations. The analysis areas and individual counties do not have much diversity and are unlikely to have minority populations. The four counties with higher poverty rates are unlikely to see disproportionately high and adverse impacts from my decision because the impacts would likely be the same for all residents and visitors.

Attachment 1 – Resource Protection Measures to be Implemented Under My Decision

The resource protection measures for federally-listed species are in the first section. They are followed by protection measures grouped by activity, protection measures for specific resources, and protection measures for environmentally sensitive zones (table 4).

Resource protection measures are actions designed to reduce impacts of proposed activities. They are derived from applicable law, regulation, or policy and include such things as best management practices (BMPs), forest and grassland plan standards and guidelines, and standard operating procedures. Analyses were completed assuming the implementation of all resource protection measures.

Protection Measures for Federally Listed Species

- No concentrated, intense weed control activities (human disturbance, motorized, mechanical, and aerial applications) will be allowed within 2 miles of greater sage-grouse breeding complexes from March 1 through June 30, unless the district biologist determined in advance that the control activity would have no detrimental effect.
- Apply herbicides at concentrations that will avoid tree mortality to protect potential habitat for raptors, lynx, and other key species. Refer to table 4 for detailed protection measures in and near wooded areas.
- Prohibit or modify pesticide use where it would have adverse effects on threatened, endangered, proposed, sensitive species or species of local concern, and minimize risk to other non-target species.

Protection measures specific to Preble's meadow jumping mouse

- If proposed chemical treatments will reduce density and/or height of tall grass structure within Preble's meadow jumping mouse habitat (up to 300 feet outside the 100 year floodplain, below 8,100 feet on the MBNF) then other treatments, such as hand-pulling or biocontrol, will be used to maintain habitat quality.
- In habitat suitable for Preble's meadow jumping mouse, prescribed fires will be designed to burn no more than 25% of the Preble's habitat within each linear mile stretch of habitat. The percentage of habitat actually burned in each linear mile will be reported to the U.S. Fish and Wildlife Service. Because of the unpredictability of fire, this standard will be achieved if no more than one of every four fires exceeds the 25% limit in size. If more than two of the first eight fires in Preble's habitat exceed 25% of the suitable habitat, the Forest Service will consult with the U.S. Fish and Wildlife Service to revise this standard (ES-6-WY-04-F003, Wyoming Ecological Services Field Office).
- Following burns in suitable habitat within the range of Preble's meadow jumping mouse, on-site surveys will be conducted to determine if vegetation has recovered, using U.S. Fish and Wildlife Service guidelines (ES-6-WY-04-F003, Wyoming Ecological Services Field Office).
- During project planning, if potential habitat occurs in the project area, survey for threatened, endangered, proposed, and candidate species on the US Fish and Wildlife

Service's species list for the forest. Provide mitigation of potential adverse effects for species present.

- In suitable Preble's meadow jumping mouse habitat, prescribed burning will only occur during their hibernation period (October 1 to May 15).
- Require hand application of herbicide within 50 feet of the edge of water (from table A-1, general protection measures for streamside zones).

Reasonable and prudent measures (from the USFWS biological opinion)

The USFWS believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of Preble's meadow jumping mouse:

1. The Medicine Bow – Routt National Forests and the Thunder Basin National Grassland shall avoid or minimize take of Preble's through the implementation of worker education programs and well-defined operational procedures with the cooperation of qualified, journey-level, wildlife biologists and botanists.
2. The Medicine Bow – Routt National Forests and the Thunder Basin National Grassland will require timely revegetation and enhancement of project areas to minimize the disturbance to Preble's habitat.
3. Reevaluate the use of prescribed fire for those years during which there is greater likelihood of activity of Preble's either late in the fall or earlier in the spring than is indicated by the typical hibernation period of Nov. 1 – April 30.

Terms and conditions (from the USFWS biological opinion)

In order to be exempt from the prohibitions of Section 9 of the Act, the MBRTB must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

The following terms and conditions implement reasonable and prudent measure #1:

1. The Medicine Bow - Routt National Forests and the Thunder Basin National Grassland shall ensure that proposed conservation measures (see Preble's-specific protection measure listed above), as further refined by these terms and conditions, are formally adopted and implemented.
2. The Medicine Bow - Routt National Forests and the Thunder Basin National Grassland shall monitor the extent of Preble's habitat annually and cumulatively impacted to ensure that it does not exceed the anticipated area of suitable habitat likely to be disturbed as a consequence of implementation of the proposed action.
3. Project activities in Preble's habitat shall not occur within Preble's active season (May 1 through October 31), or project activities in Preble's habitat during this active season shall occur during daylight hours.
4. In habitat suitable for Preble's meadow jumping mouse, the use of prescribed fire shall not occur during Preble's active season (May 1 through October 31). This term and condition differs from the conditional application of this measure as a guideline in the

current Medicine Bow National Forest Land and Resource Management Plan. But, this term and condition is consistent with the intent conveyed within the biological assessment (p. 45) and the draft environmental impact statement (p. 80) prepared for the proposed action. This is applicable to suitable Preble's habitat throughout the action area.

5. If a botanist or biologist, in their best professional judgment, believes that proposed treatments would reduce density and/or composition of native grass and shrub communities within suitable Preble's meadow jumping mouse habitat (up to ~400 feet outside of the immediate riparian area, or 300 feet beyond the 100 year floodplain if this may be accurately depicted, and below 8,100 feet on the Medicine Bow National Forest) then other treatments, such as spot-treatment with herbicides, hand-pulling, or biocontrol will be used.
6. A wildlife biologist shall conduct a training session for all implementing project personnel prior to any site-specific implementation. At a minimum, the training shall include a description of Preble's and its habitat general provisions of the Endangered Species Act, the specific measures being implemented to conserve Preble's during implementation, and the boundaries of the implementation area.
7. Work areas shall be kept clean to avoid attracting human-commensal predators of Preble's. All food-related trash items shall be enclosed in sealed containers and regularly removed from any project area.

The following terms and conditions implement reasonable and prudent measure #2:

8. The Medicine Bow - Routt National Forests and the Thunder Basin National Grassland shall require that temporarily disturbed areas in suitable Preble's habitat are revegetated within one to two years following treatment with native vegetation to the following specifications:
 - At least 80 percent of shrubs and trees are established and growing without showing signs of stress.
 - Grass and wetland plant (rushes, sedges, etc.) coverage in restored areas equals at least 80 percent of comparable undisturbed areas nearby.
 - Noxious weeds or non-native and invasive plants may cover no more than five percent of the surface area of the enhanced/ restored areas.
9. The Medicine Bow - Routt National Forests and the Thunder Basin National Grassland shall include, as a binding condition of project implementation in suitable Preble's habitat, annual monitoring of treated habitat. This shall include photographs and shall include other necessary information to determine the extent and effects of implementation. Monitoring will extend for at least three years (or until such time as the Medicine Bow - Routt National Forests and the Thunder Basin National Grassland and the Service determine that habitat has recovered, if affected, or that revegetation has been successfully completed, as applicable).

The following term and condition implements reasonable and prudent measure #3:

10. When considering the use of fire in suitable Preble's habitat, the Medicine Bow - Routt National Forests and Thunder Basin National Grassland shall, in accordance with policy requiring the site-specific preparation of prescribed burn plans, include consideration of ambient temperatures that may alter the normal hibernation period of Preble's. That is, whenever possible, implementation of prescribed burns should be avoided during periods of above average temperature following the onset of hibernation (Nov. 1) or prior to the emergence from hibernation (April 30).

Reporting requirement (from the USFWS biological opinion)

The Medicine Bow - Routt National Forests and the Thunder Basin National Grassland shall provide an annual written report, consistent with the timing of Forest Service annual monitoring (e.g., reporting related to implementation of the Southern Rockies Lynx Amendment) detailing any implementation of the proposed action in suitable Preble's habitat. This report shall contain a discussion of the activities conducted, the approximate acreage of Preble's habitat affected, any problems encountered in implementing the terms and conditions, recommendations for modifying the terms and conditions to enhance the conservation of Preble's, results of biological surveys and sighting records, and any other information that the Medicine Bow - Routt National Forests and the Thunder Basin National Grassland consider pertinent to the conservation of Preble's.

The Service anticipates that no more than 24.25 acres of Preble's habitat will be disturbed annually as a result of the use of prescribed fire to treat non-native and invasive species. We anticipate that the loss of approximately 24 Preble's home ranges will occur in any given 10-year period or 48 home ranges in the 20-year period associated with the expected duration of the record of decision for this action. We estimate that this is equivalent to the loss of 48 individual Preble's over the 20-year decision of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

In the unlikely event that a Preble's mouse is encountered (dead, injured, or hibernating) during implementation, the Wyoming Field Office of the Service shall be contacted at 307-772-2374 immediately.

Conservation recommendations (from the USFWS biological opinion)

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service recommendations are as follows:

1. In general, other project activities within or near existing Preble's habitat should take place outside Preble's active season (May 1 through October 31).
2. The Service recommends that the MBRTB continue to implement water improvement projects in suitable Preble's habitat comparable to the Pole Mountain Water Improvements Project (W. Munro 2011). That is, to continue to modify range water sources so that tanks are located outside of riparian areas and buck-and-rail fencing is used to exclude livestock from riparian areas in the immediate vicinity of water sources such as springs or seeps.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

Protection Measures for Federally Listed Plant Species

There are no federally listed plant species on the MBRTB. Potential habitat for Ute ladies' tresses (*Spiranthes diluvialis*) is suspected on the Thunder Basin and a few low-lying valleys in the Sierra Madre and on the Routt. Potential habitat was surveyed by USFS botanists in 2011 and 2012; no occurrences of Ute ladies'-tresses were discovered.

General guidance – The following apply to the development of all potential herbicide treatment projects:

- A survey of all suitable TEP plant habitat within the proposed action areas by a journey-level botanist or botanically qualified biologist, ecologist, or range management specialist to determine the presence/absence of TEP species. A minimum 2 consecutive years of survey will be required to determine presence/absence of Ute ladies' tresses (*Spiranthes diluvialis*) in suitable habitat.
- Establishment of site-specific, limited activity and no activity buffers identified by a qualified botanist, biologist, or ecologist in areas of occupied habitat within the proposed project area. Activities in these areas will be extremely limited or prohibited to protect occupied habitat.
- Collect baseline information on the existing condition of TEP plant species and their habitats in the proposed project area.
- Evaluate post-treatment monitoring data to track the effect of treatments on the size and vigor of TEP plant populations and the state of their habitats. This monitoring data will help in anticipating the future effects of vegetation treatments on TEP plant species.
- Assess potential needs for post-treatment site revegetation to minimize the opportunity for noxious weed invasion and establishment into occupied TEP plant habitat.

Treatments near occupied TEP plant habitat – At a minimum, the following restrictions must be applied:

- Given the high risk for damage to TEP plants and their habitat from burning, mechanical treatments, and use of domestic animals to contain weeds, none of these treatment methods will be utilized within 330 feet of sensitive TEP plant populations unless the treatments are specifically designed to maintain or improve the existing population.

Grazing and mechanical treatments such as haying may be employed in Ute ladies' tresses habitat if weed treatments will also enhance habitat suitability for this species.

- Off-highway use of motorized vehicles associated with treatments will be avoided in occupied habitat.
- Biological control agents that affect target plants in the same genus as TEP plants must not be used to control target species occurring within the dispersal distance of the agent.
- Prior to use of biological control agents that affect target plants in the same family as TEP plants, the specificity of the agent with respect to factors such as physiology and morphology will be evaluated and a determination as to risks to the TEP species made.
- Herbicide treatments will not be conducted in areas where TEP plant species may be subject to direct spray by herbicides during treatments.
- To avoid negative effects to TEP plant species from off-site drift, surface runoff, and/or wind erosion, suitable buffer zones will be established between treatment sites and populations of TEP plant species and site-specific precautions will be taken (refer to the guidance provided below). Buffer zone distances will vary by method of treatment, chemical used and TEP plant habitat type.
- Within buffer zones, limited herbicide treatments such as low boom spraying and spot treatment via hand held wands, backpack sprayers, wicking, etc. may be conducted if the threat of weed invasion into occupied TEP plant habitat is thought to be greater than the threat of herbicide use. Treatment in buffer zones must be approved by a qualified botanist or biologist and will only occur if the treatment is not thought to pose risks to TEP plant populations. A minimum no-activity buffer of 25 feet will be maintained around all TEP plants. Precautions such as the construction of physical barriers, treatment during TEP plant dormancy, and treatment during favorable climatic conditions will be used to protect TEP plant populations from herbicide drift and other indirect impacts.
- Follow all label instructions, resource protection measures, and Forest Service standards and guidelines to avoid spill and direct spray scenarios into aquatic habitats that support TEP plant species.
- Follow all resource protection measures for avoiding herbicide treatments during climatic conditions that would increase the likelihood of spray drift or surface runoff.

For broadcast spraying of herbicides, ground (high boom) or aerial: Manual spot treatment and low boom ground application of undesirable vegetation can occur within the listed buffer zones if it is determined by local botanists or designated resource specialists that this method of herbicide application would not pose risks to TEP plant species in the vicinity. Additional precautions during spot treatments of vegetation within habitats where TEP plant species occur will be considered while planning local treatment programs.

The buffer distances provided below are conservative estimates, based on the information provided in past analyses by the BLM (USDI Bureau of Land Management 2007) and are designed to provide protection to TEP plants. Herbicides approved in the future and not listed below will be subject to limited and no-activity buffer distances and other appropriate restrictions designed to protect TEP plant populations.

2,4-D

- Do not high boom or aerially spray within ½ mile of terrestrial TEP plant species or aquatic habitats where TEP aquatic plant species occur.
- Do not use aquatic formulations in aquatic habitats where TEP aquatic plant species occur.
- Assess local site conditions when evaluating the risks from surface water runoff to TEP plants located within ½ mile down gradient from the treatment area.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Chlorsulfuron

- Do not apply by high boom ground methods within 1,200 feet of terrestrial TEP plant species.
- Do not apply by aerial methods within 1,500 feet of terrestrial TEP plant species.
- Do not apply by low boom or spot treatment methods within 25 feet of aquatic habitats where TEP plant species occur.
- Do not apply by aerial methods at the maximum application rate within 300 feet of aquatic habitats where TEP plant species occur.
- Do not apply by aerial methods at the typical application rate within 100 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Clopyralid

- Do not apply by aerial methods within ½ mile of terrestrial TEP plant species.
- Since the risks associated with using a high boom are unknown, do not apply by high boom ground methods within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply by low boom ground methods at the typical application rate within 900 feet of terrestrial TEP plant species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Dicamba

- Do not apply by low boom or high boom ground methods at any application rate (typical or maximum) within 1,050 feet of terrestrial TEP plant species.
- Do not apply by any method within 25 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Glyphosate

- Since the risks associated with using a high boom are unknown, do not apply by high boom ground methods within ½ mile of terrestrial TEP plant species.

- Do not apply by low boom ground methods at the maximum application rate within 300 feet of terrestrial TEP plant species.
- Do not apply by low boom ground methods at the typical application rate within 50 feet of terrestrial TEP plant species.
- Do not apply by aerial methods within 300 feet of terrestrial TEP plant species.

Hexazinone

- Since the risks associated with using a high boom or an aerial application are unknown, do not apply by aerial or high boom ground methods within ½ mile of terrestrial TEP plant species and aquatic habitats that support aquatic TEP species.
- Do not apply by low boom ground methods at the typical application rate within 300 feet of terrestrial TEP plant species or aquatic habitats that support aquatic TEP plant species.
- Do not apply by low boom ground methods at the maximum application rate within 900 feet of terrestrial TEP plant species or aquatic habitats that support aquatic TEP plant species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Imazapic

- Do not apply by aerial methods at the maximum application rate within 300 feet of aquatic TEP species.
- Do not apply by aerial methods at the typical application rate within 100 feet of aquatic TEP plant species.
- Do not apply aerially by plane at the maximum application rate within 900 feet of terrestrial TEP plant species.
- Do not apply aerially by helicopter at the maximum application rate, or by plane at the typical application rate, within 300 feet of terrestrial TEP plant species.
- Do not apply aerially by helicopter at the typical application rate within 25 feet of terrestrial TEP plant species.
- Do not apply by high or low boom ground methods within 25 feet of terrestrial TEP plant species or aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Imazapyr

- Since the risks associated with using a high boom are unknown, do not apply by high boom ground methods within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply at the maximum application rate, by low boom ground or aerial methods, within ½ mile of terrestrial TEP plant species or aquatic habitats in which aquatic TEP plant species occur.

- Do not apply at the typical application rate, by low boom ground or aerial methods, within 900 feet of terrestrial TEP plant species or aquatic habitats in which aquatic TEP plant species occur.
- Do not use aquatic formulations in aquatic habitats where TEP aquatic plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Metsulfuron methyl

- Since the risks associated with using a high boom are unknown, do not apply by high boom ground methods within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply at the maximum application rate, by low boom ground or aerial methods, within ½ mile of terrestrial TEP plant species or aquatic habitats in which aquatic TEP species occur.
- Do not apply at the typical application rate, by low boom ground or aerial methods, within 900 feet of terrestrial TEP plant species or aquatic habitats in which aquatic TEP species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Picloram

- Do not apply by low or high boom ground or aerial methods, at any application rate, within ½ mile of terrestrial TEP plant species.
- Assess local site conditions when evaluating the risks from surface water runoff to TEP plants located within ½ mile down gradient from the treatment area.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Sulfometuron methyl

- Do not apply by high or low boom ground or aerial methods within 1,500 feet of terrestrial TEP plant species.
- Do not apply by aerial methods within 1,500 feet of aquatic habitats where TEP plant species occur.
- Do not apply by low or high boom ground methods within 900 feet of aquatic habitats where TEP plant species occur,
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Triclopyr acid

- Since the risks associated with using a high boom are unknown, do not apply by high boom ground methods within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply by low boom ground or aerial methods at the maximum application rate within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.

- Do not apply by aerial methods at the typical application rate within 500 feet of terrestrial TEP plant species.
- Do not apply by low boom ground methods at the typical application rate within 300 feet of terrestrial TEP plant species.
- If applying to aquatic habitats in which aquatic TEP plant species occur, do not exceed the targeted water concentration on the product label.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Triclopyr BEE

- Since the risks associated with using a high boom are unknown, do not apply by high boom ground methods within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply by low boom ground or aerial methods at the maximum application rate within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply by aerial methods at the typical application rate within 500 feet of terrestrial TEP plant species.
- Do not apply by low boom ground methods at the typical application rate within 300 feet of terrestrial TEP plant species.
- Do not use aquatic formulations in aquatic habitats where TEP aquatic plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Protection Measures by Activity

Prevention of weed introduction and spread

- Educate all Forest Service field personal so they are aware of, and knowledgeable about, invasive plant species (FSM 2902).
- On NFS lands, it is prohibited to possess or store any hay, hay cubes, straw, grain, or other forage or mulch product, without original and current documentation from a state certification process which meets or exceeds the North American Weed Free Forage (NAWFF) or comparable certification standard (USDA Forest Service, Rocky Mountain Region Weed Free Forage Products Order R2-2005-01) This includes products used for revegetation projects by the U.S. Forest Service.
- Use contract and permit clauses to prevent the introduction or spread of noxious weeds by contractors and permittees (FSM 2904, Amendment No. 2000-95-5). This includes timber sale contract clauses RO-K-G.6.0.2#, RO-K-GT.6.0.2#, RO-C6.602#, RO-CT6.602# and B6.35 and special use permit clauses R2-D-103 (R2 Supplement 2709.11-2006-1).
- All purchased seed will be certified noxious weed free (refer to MBRTB Revegetation Guidelines).

- Where noxious weeds or other harmful invasive plant species are present on a project site or near enough to pose a threat of colonizing disturbed areas, seed the disturbed area with approved plant materials as specified in the MBRTB Revegetation Guidelines.
- Before using any gravel, topsoil or other fill products on NFS lands, be sure the source, pits, or stockpiles have been treated and are free of noxious weeds. Sites will be inspected regularly. All gravel, topsoil, or other fill products to be used on NFS lands will be pre-treated before transporting.
- Prevention measures specific to wildfire:
 - Minimize weed spread in fire camps by incorporating weed prevention and containment practices such as mowing, flagging or fencing weed patches, designating weed-free travel routes, and washing equipment.
 - Inspect all vehicles involved in fire suppression regularly to assure that undercarriages and grill works are kept free of weed seeds.

Coordination

- Where traditional cultural plant gathering areas have been identified, tribal consultation may be done to address any additional mitigation measures needed to minimize effects to various aspects of the activity. These could include, but are not limited to, adjusting the timing of the treatment, adjusting the type of treatment, and adjusting the priority of the treatment.
- If any treatment is desired within RNA boundaries, concurrence must be obtained from the cooperating USFS Research Station and all other relevant partners prior to treatment implementation.
- In cooperation with federal, state, and county agencies, NFS lands adjacent to other ownership will be selectively treated to coincide with active invasive plant management projects. Decisions regarding treatment methods and buffer width on land adjacent to privately owned land or land managed by other agencies will be negotiated between the Forest Service and the other owner/agency.
- District or forest invasive plant coordinators will coordinate a review of invasive plant management projects with the district/forest resource specialists to identify specific resource conditions that may be affected by control activities and to ensure the protection measures are implemented properly.
- If treatment is desired in Special Interest Areas (SIAs) that have special values, treatment must be planned and executed with concurrence from the appropriate forest program manager for that value.
- The U.S. Fish and Wildlife Service require annual reporting on activities conducted in Preble's meadow jumping mouse habitat.

Travel management compliance

- Treatment activities will follow local motorized travel management plan or applicable public land laws, rules, regulations, and orders. Variances to motorized travel plans may

be allowed for administrative motorized access to conduct weed treatment activities in areas approved by the authorized officer.

Prescribed burning

General

- Any prescribed burning conducted for weed control will be conducted in accordance with Medicine Bow-Routt National Forests and Thunder Basin National Grassland fire management policy which requires the site-specific preparation of a prescribed burn plan before every burn.
- Avoid burning sites with high risk of weed invasion unless effective post-burn treatment methods and funding are incorporated into project planning.

Sagebrush habitat

- Restrict or contain fire within normal range of fire activity (assuming a healthy native perennial sagebrush community), including size and frequency, as defined by the best available science.
- Limit intentional fires in sagebrush habitats, including prescribed burning of breeding and winter habitats unless it can be demonstrated to be beneficial to local sage-grouse populations.
- Design and implement restoration of burned sagebrush habitats to allow for natural succession to healthy native sagebrush plant communities.
- Implement monitoring programs for restoration activities. Monitoring must continue until restoration is complete.
- Immediately suppress wildfire in all sagebrush habitats.

Biological control

- Only biological control agents that have been approved by USDA Animal Plant Health Inspection Service (APHIS) will be released.
- Where biocontrol agents have become successfully established, protect those sites from other forms of weed control to promote spread of the biocontrol agents and provide collection locations for release at other sites.

Livestock grazing

- Consider the timing, stocking rate, and duration of permitted livestock grazing following invasive plant treatment to optimize treatment effectiveness depending on the amount and type of treatment, treatment objectives, and site-specific conditions.
- All proposals for domestic goat or sheep grazing for weed control on the national forests will be coordinated with the appropriate state wildlife management agency biologist to determine potential impacts to bighorn sheep.
- Domestic sheep and/or goats may only be used for invasive plant control if consultation with district and forest biologists and state wildlife management agencies indicate the

risk of disease transmission to bighorn sheep is very low. Using the risk-of-contact tool is recommended (O'Brien et al. 2014, Carpenter et al. 2014, and USDA Forest Service 2013).

- If funding or personnel are not available to complete the risk-of-contact tool, then targeted grazing by domestic sheep or goats will not occur within 6 miles of the seasonal ranges documented by the state wildlife management agencies within the Encampment River, Douglas Creek, Laramie Peak, Zirkel, Gore Canyon, and Flat Tops bighorn sheep herds.
- Domestic sheep or goats used for weed control must be confined to the weed treatment area and the risk of straying animals must be minimized using a combination of the following methods:

For all weed-control sheep or goat bands

- Sheep and goats must be effectively herded or confined with fencing to assure the target invasive is being removed or reduced in density, and the animals must be removed as soon as the weed treatment has been accomplished.
- Domestic sheep or goats that stray out of the weed control area pose a risk of interaction and will be reported immediately to the local Forest Service office, and every effort will be made by the operator to return any strays to the weed control area or remove them from the national forest as soon as possible or as otherwise specified by the Forest Service.

For large bands (greater than 50 animals)

- Maintain an appropriate ratio of marker sheep within bands. Depending on local needs and conditions, ratios will be no less than 1 marker for every 100 adult sheep. More markers may be required when dictated by local conditions.
- Place mature and effective guard dogs with the livestock and/or employ both day and night herders to keep predators from scattering the stock.
- Place bells on at least 1 in every 100 mature ewes/does to help locate sheep or goats that escape containment by the herder or fence.

For small bands (50 animals or fewer)

- Operators will count every domestic sheep or goat every morning and afternoon to verify that none have escaped the weed control area.
- Avoid grazing female ewes or does that are not pregnant on treatment areas on the national forests because female sheep and goats in estrus attract bighorn rams.
- Provide instruction/training and supervision for those tending livestock used for targeted grazing concerning recognizing bighorn sheep and allowable methods for preventing contact between bighorn sheep and domestic bands.
- Operators will immediately notify the Forest Service and the state wildlife management agency if bighorn sheep come in contact with domestic sheep or goats. Sheepherders will be expected to provide exact location of bighorn sheep at last sighting.
- Domestic sheep and goats used for weed control should be in good health. Herd health evaluations will be made prior to release or turn-out to help reduce the potential for introducing new pathogens or pathogen strains into established bighorn sheep herds.

Any physically disabled or sick animals discovered during weed control will be removed promptly from national forest lands.

Revegetation

- Seeding with native seed will only occur if desirable competitive plants do not re-emerge and dominate the vegetation community after the weed species is treated (refer to MBRTB Revegetation Guidelines).

Mechanical treatment

- To limit the potential for equipment to spread invasive plant seeds, mechanical treatments will be completed before seed becomes viable.
- Disposal of plants that are grubbed or manually removed will be as follows: If no flowers or seeds are present, pull the plant and place it off the ground, if possible, to dry out. If flowers or seeds are present, pull and place plants in a plastic bag or a container to retain seeds. Dispose of plants by burning them or taking them in closed garbage bags to a sanitary landfill.
- Delay mowing of grasslands outside mapped prairie dog colonies until July 15 or later to protect ground-nesting birds, including their nests and young broods. Project-level analyses will determine the earliest mowing date (TBNG LRMP).
- Avoid or mitigate mechanical treatment methods that have potential to adversely affect the viability of known sensitive plant species populations.

Ground-based herbicide application

General

- Before spraying herbicides near residential areas, check the sensitivity registry maintained by the Colorado Department of Agriculture for a list of chemically sensitive individuals. Twenty-four hours prior to herbicide application, notify those individuals who are on the registry and have property abutting the treatment area. The registry is for people who have documentation of sensitivity to pesticide products from a licensed Colorado physician. The registry does not prevent application of pesticides but only requires that commercial applicators notify people on the registry 24 hours before an application is made to abutting property so they can leave for a period of time.
- Notify the landowners⁵ 24 hours before ground spraying within 65 feet of their property located at T14N, R77W, sections 12, 13, 7, and 18. The twenty-four hours' notice is to maintain consistency with the notification requirements for the sensitivity registry maintained by the Colorado Department of Agriculture. Sixty-five feet is the recommended minimal buffer zone for aerial spraying applications in the Missoula Valley. Buffer zones for ground spraying are less than 65 feet (Felsot 2001).
- Herbicides will be used in accordance with U.S. Environmental Protection Agency (EPA) label instructions and restrictions. Label restrictions on herbicides are developed to mitigate, reduce, or eliminate potential risks to humans and the environment. Label

⁵ Mr. and Mrs. Scott B. Smith, 833 State Highway 11, Laramie, WY 82070.

information and requirements include personal protective equipment, user safety, first aid, environmental hazards, directions for use, storage and disposal, general information, mixing and application methods, approved uses, weeds controlled, and application rates. It is a violation of federal law to use an herbicide in a manner inconsistent with its labeling.

- Additional herbicides may be considered for use within the project area in the future. Only EPA-registered herbicides having a completed risk assessment will be considered for use.
- Adhere to all guidelines and protection measures in the Forest Service Manual 2150, Pesticide Use Management and Coordination, and in the Forest Service Handbook 2109.14, Pesticide Use Management and Coordination Handbook.
- Applicators or operators must wear all required protective gear listed on the label of the herbicide they are using (FSH 6709.11).
- Application will be conducted or supervised by licensed applicators or trained technicians, as required by law.
- Operators will calibrate spray equipment at regular intervals to ensure proper rates of herbicide applications.
- The local herbicide coordinator will maintain daily records of herbicide use, including temperature, wind speed and direction, herbicide and formulation uses, quantity of herbicide and diluting agents applied, location and method of application, acreage, and persons applying herbicides.
- Procedures for mixing, loading, and disposal of pesticides and a spill plan will be followed (Label and FSH 2109.14, 43). All herbicide storage, mixing, and post-application equipment cleaning is completed in such a manner as to prevent the potential contamination of any perennial or intermittent waterway, unprotected ephemeral waterway, or wetland. Herbicide applicators shall carry spill containment equipment and be familiar with and carry an herbicide emergency spill plan.
- In occupied public recreation areas (such as developed campgrounds, trailheads, other areas of concentrated use), post notification of the treated area until the area is safe to re-enter as defined by the product label (usually 12 to 48 hours).
- Apply herbicides at concentrations that will avoid tree mortality to protect potential habitat for raptors, lynx, and other key species. Refer to table 4 for detailed protection measures in and near wooded areas.
- Prohibit or modify pesticide use where it would have adverse effects on threatened, endangered, proposed, sensitive species or species of local concern and minimize risk to other non-target species.

Water resources

- Only aquatically approved chemicals will be used over live water (streams, ponds, springs, etc.), including water standing or running in ditches. Weeds overhanging a waterway or growing within the channel should be treated as an aquatic situation (including stock tanks).

- Follow herbicide label restrictions regarding use near functioning potable water sources. Herbicides can have varying setback restrictions near functioning/active potable water intakes. For example, labels of glyphosate products registered for aquatic weed control state, “Do not apply this product in flowing water within 0.5 mile up-stream of active potable water intake”.
- Ground herbicide terrestrial applications will maintain a 50 foot buffer around all water sources/wellheads unless the formulations are approved for “in or near water”.
- In areas with high or unacceptable risk of groundwater contamination, use hand applications (spot treat, wick, etc.); for broadcast application, do not use clopyralid, dicamba, hexazinone, or picloram.
- Locate vehicle service and fuel areas, chemical storage and use areas, and waste dumps and areas on gentle upland sites. Mix, load, and clean on gentle upland sites. Dispose of chemicals and containers in state-certified disposal areas. (Watershed Conservation Practices Handbook FSH 2509.25 – R2 Amendment 2509.25-2006-2)
- During use periods, inspect chemical transportation, storage, or application equipment for leaks. If leaks occur, report them and install emergency traps to contain them and clean them up. Refer to FSH 6709.11, chapter 60 for direction on working with hazardous materials. Report chemical spills and take appropriate clean-up action in accordance with applicable state and federal laws, rules and regulations. Contaminated soils and other material shall be removed from NFS lands and disposed of in a manner according to state and federal laws, rules, and regulations (Watershed Conservation Practices Handbook FSH 2509.25 – R2 Amendment 2509.25-2006-2).
- Apply chemicals using methods that minimize risk of entry to surface and ground water. Favor pesticides with half-lives of 3 months or less, when practicable, to achieve treatment objectives. Apply at lowest effective rates as large droplets or pellets. Follow the label directions. Favor selective treatment (Watershed Conservation Practices Handbook FSH 2509.25 – R2 Amendment 2509.25-2006-2).
- Use only aquatic-labeled chemicals in the water influence zone (Watershed Conservation Practices Handbook FSH 2509.25 – R2 Amendment 2509.25-2006-2).
- Spray only when heavy rain is not expected, per label directions.
- If spraying towards a waterway, clearly mark the edge beforehand.
- Carry herbicide only in secure containers. If non-original containers are used, the product must be clearly identified with accompanying label present.
- Only add surfactants specified on the label to herbicides registered for aquatic use.
- Mix chemicals and rinse equipment well away from the waterway.

Wildlife and aquatic organisms

- Due to toxicity to fish, ester formulations of herbicides (i.e., 2, 4-D ester, triclopyr ester (Garlon 4)) are prohibited from use in streamside or wetland areas where fisheries and aquatic dependent (tadpoles) amphibian life stages occur.
- When ground application of herbicide is necessary within 50 feet of a water body, surveys of the treatment area will be required. If adult northern leopard frogs, wood

frogs, or boreal toads are identified, the extent of distribution within the proposed treatment area will be marked on the ground and reported to the district amphibian specialist and invasive plant coordinator. Herbicide will not be sprayed if amphibians are known to be present and cannot be avoided. Hand-pulling or wick application of herbicide will be used instead. If tadpoles or metamorphs are identified, the location will be reported to the local amphibian specialist (fisheries or wildlife biologist) and invasive plant coordinator, and application of herbicides will be delayed until metamorphs disperse.

Sensitive plant species

- Broadcast (boom) applications of chlorsulfuron or sulfometuron methyl are prohibited within 1,500 feet of sensitive plant occurrences. Selective hand spot or wick treatment with this herbicide is allowed within this setback.
- When applying herbicides within 50 feet of sensitive plants, spot treat via hand held wands, backpack sprayers, wick, etc. using an herbicide that does not persist in the soil (picloram and imazapic are more persistent in soils) and protect sensitive plants from herbicide drift; for example, cover plant with plastic when spraying herbicide or use a wick applicator.
- Chlorsulfuron, imazapyr, and sulfometuron methyl are prohibited within the 50-foot buffer zone around sensitive plants. The broad-spectrum herbicide, glyphosate, may be applied within the 50 feet buffer only if the sensitive plant species is dormant.
- Ensure that the herbicide used does not target the family of the specific sensitive plant species. For example, herbicides targeted for the composite/aster family (i.e. aminopyralid, clopyralid) will not be used near Colorado tansyaster occurrences. Monocots (species of grass, sedge, lily and orchid families) are tolerant to clopyralid, 2, 4-D, and triclopyr. Dicamba and picloram are also considered safe around monocots at lower formulations.

Aerial application of herbicides

General

- Before spraying herbicides near residential areas, check the sensitivity registry maintained by the Colorado Department of Agriculture for a list of chemically sensitive individuals. Twenty-four hours prior to herbicide application, notify those individuals who are on the registry and have property abutting the treatment area. The registry is for people who have documentation of sensitivity to pesticide products from a licensed Colorado physician. The registry does not prevent application of pesticides but only requires that commercial applicators notify people on the registry 24 hours before an application is made to abutting property so they can leave for a period of time.
- Notify the landowners⁶ 24 hours before aerial spraying within 300 feet of their property located at T14N, R77W, sections 12, 13, 7, and 18. The twenty-four hours' notice is to maintain consistency with the notification requirements for the sensitivity registry

⁶ Mr. and Mrs. Scott B. Smith, 833 State Highway 11, Laramie, WY 82070. Email cma@a-hlaw.com

maintained by the Colorado Department of Agriculture. Three hundred feet is the minimum buffer for aerial application around campgrounds, recreation residences, and private residential areas (see bullet #6 below).

- All aviation activities will be in accordance with FSM 5700 (Aviation Management), FSM 2150 (Pesticide Use Management and Coordination), FSH 5709.16 (Flight Operations Handbook), FSH 2109.14, 50 (Quality Control Monitoring and Post-Treatment Evaluation). A project aviation safety plan will be developed prior to aerial spray applications.
- Any non-selective herbicides that are aerially applied will be used at rates that are low enough to limit injury to desirable species or used during periods when non-target plants are dormant.
- Aerial applications will be excluded from designated Wilderness and Research Natural Areas unless needed on a site-specific basis to protect the native plant populations for which the area is being managed.
- Provide a minimum buffer of 300 feet for aerial application of herbicides from developed campgrounds, recreation residences and private residential areas (unless otherwise authorized by adjacent private landowners). Treat outside of high use periods where feasible. Temporary closures of campgrounds will be considered to ensure public safety during spray operations.
- Signing and on-site layout will be performed one to two weeks prior to actual aerial treatment.
- Temporary area and road/trail closures will be used to ensure public safety during aerial spray operations.
- Constant communications will be maintained between the aircraft and project leader during spraying operations. Ground observers will have communication with the project leader. Observers will be located at various locations adjacent to the treatment area to monitor wind direction and speed as well as to visually monitor drift and deposition of herbicide.
- Herbicides that contain the surfactants POEA (polyoxyethyleneamine) or MON-0818 (polyoxyethylene tallowamine) will not be aerially applied.

Protection measures to reduce spray drift

- Application will occur only when wind speeds are less than 6 mph (or per label instruction). Spray drift is largely a function of droplet particle size, release height, air temperature and wind speed. Incorporate these factors into project design to reduce the risk of drift.
- Aerial spray units will be field-validated, flagged, and/or marked using GPS prior to spraying to ensure only appropriate portions of the unit are aerially treated. To ensure that aerial treatments stay within intended treatment areas, units will be GPSed before and during the flight.
- A field inspector will be present during all aerial applications to monitor drift using spray detection cards placed in buffer areas. Cards will be placed prior to herbicide application and will be sufficient in number and distribution to adequately determine when drift of

herbicide into the buffer area exceeds acceptable levels. Non-toxic dye will be added to make herbicide visible on spray cards. Dye will allow observers to see herbicide as it is sprayed and to visually monitor drift or vortices from boom and rotor tips.

- Drift reduction agents, nozzles that create large droplets, and special boom and nozzle placement will be used to reduce drift during aerial spraying.
- Drift control agents will be used in aerial spraying during low humidity to reduce drift into non-target areas. Products that reduce volatility, keep droplet sizes larger, and are the appropriate adjuvant for the herbicide (as specified by labeling of both the herbicide and the drift agent, in consultation with the herbicide manufacturer) will be used.
- Aerial spraying will be discontinued if herbicide is drifting within the set-back zone and/or wind speed exceeds those recommended on the product's label.
- Weather conditions will be monitored on-site (temperature, humidity, wind speed and direction), and spot forecasts will be reviewed for adverse weather conditions.
- Maintain boom pressure at less than 40 psi and use nozzles designed for medium to coarse droplet size (240 to 400 microns). Use a drift agent to help maintain large droplet size.
- Monitor treatment boundaries next to sensitive areas with spray deposit cards to detect any possible drift. Train people in how to handle the cards, interpret the cards (many things can contaminate the cards such as dew, moisture from hands, insects) and also document results. Card lines will also be placed in treated areas under full spray to serve as a reference.

Water resources

- During contract preparation for aerial application, reassess surface water quality risk with site-specific information. Once the exact treatment areas are delineated in preparation for the contract, determine treatment acres for 6th hydrologic unit code (HUC) watersheds potentially affected by aerial application if picloram is used. Incorporate these acres into the risk assessment to estimate probable herbicide concentrations and allowable treatment acres. If concentrations of picloram exceed the recommended safe threshold, reduce treatment acres to the allowable amount or use herbicides approved for use near surface water.
- On each side of aquatic, streamside or wetlands areas, establish a 300-foot buffer where aerial applications will not be allowed.

Wildlife and aquatic organisms

- Restrict aerial applications within 1 mile of bald eagle winter roost sites. Applications will not occur before 9:00am or after 3:00 pm to prevent roost disturbance from November 1 through March 31.

Sensitive plant species

- No aerial application of herbicide will occur within a 300 feet of any sensitive plant populations. Buffers around sensitive plants will be generated using the most current species information available, which will include Wyoming and Colorado state records of

plant occurrences (databases maintained by Colorado Natural Heritage Program and Wyoming Natural Diversity Database), records in the Forest Service natural resource manager database, and recent field survey results.

General Protection Measures by Resource

Rare Plants

This is not intended to be a list of all the protection measures that will protect rare plants, but rather those designed to protect rare plants under all activities.

- Weed infested sites must be evaluated for federally-listed threatened and endangered and Forest Service regionally listed sensitive (TE&S) plants before treatment. A control plan will be developed to help protect any rare plants present. Crews and/or contractors will be provided maps of all known rare plant occurrences so the sites can be identified and protected. Crews will be trained to identify rare plants so new sites can be identified and protected. The local botanist or designated resource specialist will be consulted prior to treating in the proximity of known rare plant populations.
- Always use the control method with the least impact on the rare plants. For example, pull non-rhizomatous weeds if the roots of the rare plant will not be detrimentally affected by the soil disturbance.

Wildlife and Aquatic Organisms

This is not intended to be a list of all the protection measures that will protect wildlife and aquatic organisms, but rather those designed to protect wildlife and aquatic organisms under all activities.

- No concentrated, intense weed control activities (human disturbance, motorized, mechanical, and aerial applications) will be allowed as listed below:
 - Within mapped prairie dog colonies, no activities will occur from March 15 through July 31 to protect mountain plover during nesting, unless coordinated with district biologist. This will also provide protection for black-footed ferrets, burrowing owls, black-tailed prairie dogs, as well as other grassland sensitive or key species.
 - Within 1 mile of bighorn sheep lambing areas from April 1 through June 30.
 - Within 2 miles of Columbian sharp-tailed grouse and plains sharp-tailed grouse breeding complexes from March 1 through June 30, unless coordinated with district biologist.
 - Within ½ mile of greater sandhill crane breeding areas from March 1 through June 30.
 - Within ¼ mile of active flammulated owl, short-eared owl, great-horned owl, northern goshawk, Cooper's hawk, and sharp-shinned hawk nests from March 1 through August 30, unless coordinated with district biologist.
 - Within 1 mile of active bald eagle nests from February 1 through August 15.
 - Within ½ mile of active golden eagle nests from February 1 through August 15.
 - Within ½ mile of active ferruginous hawk nests from March 1 through July 31.

- Within ½ mile of active peregrine falcon, prairie falcon, and merlin nests from March 1 through August 15.
- Within ½ mile of active northern harrier, osprey, Swainson's hawk, and red-tailed hawk nests from March 1 through August 15.
- Design vegetation management activities and pesticide application projects in known habitats of sensitive butterfly species to reduce mortality of butterflies and to maintain or enhance nectar and larvae host plant species.

Herbicide-specific Resource Protection for Environmentally Sensitive Zones

Herbicides that are approved for rangeland use are generally benign to soil and soil microorganisms in most soil types. Nevertheless, the specific properties of the herbicides require special attention, particularly when used near surface waters, shallow groundwater, domestic water supplies, and woodlands. The protection measures in the following table are intended to minimize contamination of water resources and to minimize injury to non-target desired woody plants from herbicide use in the following environmentally sensitive sites:

- Aquatic Zone (AZ): The area where aquatic plants, floating plants, submersed plants, and emergent plants grow in ponds, lakes, reservoirs, marshes, drainage ditches, and streams that are still or slow moving.
- Streamside Zone (SZ): Moving water systems (lotic) containing, and adjacent to, stream channels and floodplains having the presence of obligate riparian vegetation, facultative (optional or discretionary) riparian vegetation, or both.
- Wetland Zone (WZ) Saturated wetland systems (lentic) that have saturated or seasonally saturated soils and support mostly obligate and facultative wetland vegetation and aquatic life); includes swamps, bogs, potholes, lakes, ponds, man-made reservoirs, and stock ponds.
- Groundwater Vulnerable Zone (GVZ): Shallow groundwater areas underlying permeable soils that are especially vulnerable to contamination from some herbicides.
- Wellhead Protection Areas (WPA): A 50-foot radius around an underground developed and functioning source of drinking water.
- Woodland Zone (WDZ): Hardwood draws, stands of conifers, stands of juniper, aspen groves, and riparian forest stands. Saltcedar areas are not considered woodlands.

Table 1: Protection measures for environmentally sensitive zones by herbicide.

Management Zone ¹						
	Aquatic Zone (AZ) includes ponded or slow waters that support aquatic plants (i.e. purple loosestrife). ²	Streamside Zone (SZ) . ³ includes perennial and intermittent stream riparian areas.	Wetland Zone (WZ) are the seasonal and permanent wetlands	Groundwater Vulnerable Zone (GVZ) . ⁴ the shallow groundwater beneath permeable soils; most often riparian areas.... ⁵	Wellhead Protection Zone (WPZ) . ⁶ is a 50 foot radius around an underground developed and functioning source of drinking water.	Woodland Zone (WDZ) includes hardwood draws, stands of conifers, stands of juniper, aspen groves, and riparian forest stands. Saltcedar areas are not considered woodlands.
General Protection Measures	<ul style="list-style-type: none"> Only those formulations that have been approved for use in or adjacent to water are permitted.⁷ All other formulations are prohibited. Only surfactants labeled for use in & around water will be permitted. 	<ul style="list-style-type: none"> Ground based boom application is allowed up to 50 feet from water's edge. Application within 50 feet must be done with hand application (hand-held wand, backpack sprayer, wicking, etc.). If allowed by the label, wicking applications up to the water's edge is allowed, including use of the otherwise "prohibited" or "limited" herbicides....⁸ Only surfactants labeled for use in and around water would be permitted. Due to toxicity to fish, ester formulations of herbicides are prohibited where fisheries occur 	<ul style="list-style-type: none"> Same Protection Measures as SZs. 	<ul style="list-style-type: none"> Use hand application, or for broadcast application use an alternate herbicide with a lower leachability than clocpyralid, dicamba, hexazinone or picloram The same prohibitions, limitations, and uses listed under the SZs and WZs apply to GVZs with exceptions listed below. 	<ul style="list-style-type: none"> Unless otherwise directed by label, ground herbicide application within a 50 foot radius of functioning potable water intakes / wellheads will use only products approved for use in or near water. 	
2, 4-D . ⁹ Thistles, sulfur cinquefoil, dyers woad, knapweeds, purple loosestrife, hoary cress, Some broadleaf, woody and aquatic plants susceptible. Amine is labeled for terrestrial and aquatic use. Hi-Dep IVM is labeled for terrestrial applications, and non-irrigation ditchbanks.	<p>Use Permitted</p> <ul style="list-style-type: none"> Aquatic formulations only Consult with Fisheries Specialist. <p>Use Prohibited</p> <p>Non-aquatic formulations</p>	<p>Limited Use</p> <ul style="list-style-type: none"> Use only formulations approved for use in or near water. In the amine form or aquatic labeled formulations it can be applied up to the water's edge (without direct contact to the water). <p>Use Prohibited</p> <p>Non-aquatic formulations</p>	<p>Same as SZ for 2, 4-D except:</p> <ul style="list-style-type: none"> Allowed up to 25 feet from water's edge if there is a vegetative buffer...¹⁰ with slopes <6% 	<p>Use Permitted</p> <ul style="list-style-type: none"> Aquatic or non-aquatic 2, 4-D may be applied. 	<p>Limited Use</p> <ul style="list-style-type: none"> Same as SZ and GVZ for 2, 4-D. 	<p>Limited Use</p> <ul style="list-style-type: none"> Spot treatment only within 50 feet of woodlands. Under canopy of desired woody plants, spot apply to foliage of target plants and avoid direct or indirect application to non-target plants or soil.
Aminopyralid . ¹¹ Perennial and biennial thistles, knapweeds, sulfur cinquefoil. Tolerated by most grasses. Milestone is labeled for terrestrial applications. Do not apply in surface water	<p>Use Prohibited</p>	<p>Permitted Use</p> <p>It can be applied up to the water's edge (without direct contact to the water).</p> <ul style="list-style-type: none"> Per label instruction, not to be used in areas of standing water. 	<p>Use Permitted</p> <p>Per label instruction, not to be used in areas of standing water.</p>	<p>Use Permitted</p>	<p>Use Permitted</p>	<p>Limited Use</p> <p>Spot treatment only within 50 feet of non-targeted woodlands or under canopy of desired woody plants. Do not apply over canopy in non-targeted areas. Avoid direct or indirect application to non-target plants or soil.</p>

*Medicine Bow – Routt National Forests
and Thunder Basin National Grassland*

Management Zone. ¹						
	Aquatic Zone (AZ) includes ponded or slow waters that support aquatic plants (i.e. purple loosestrife). ²	Streamside Zone (SZ). ³ includes perennial and intermittent stream riparian areas.	Wetland Zone (WZ) are the seasonal and permanent wetlands	Groundwater Vulnerable Zone (GVZ). ⁴ the shallow groundwater beneath permeable soils; most often riparian areas. ⁵	Wellhead Protection Zone (WPZ). ⁶ is a 50 foot radius around an underground developed and functioning source of drinking water.	Woodland Zone (WDZ) includes hardwood draws, stands of conifers, stands of juniper, aspen groves, and riparian forest stands. Saltcedar areas are not considered woodlands.
Chlorsulfuron. ¹² Spot treatment only with hand application methods. Dyer's woad, thistles, common tansy, hoary cress, houndstongue. Some broadleaf plants and grasses susceptible. Telar is labeled for terrestrial use only.	Use Prohibited	Limited Use <ul style="list-style-type: none"> Do not use in flooded areas or on saturated soils. Spot treatment allowed up to 5 feet from water's edge. Use only once per growing season on alkaline soils. 	Same as SZ except: <ul style="list-style-type: none"> Spot treatment allowed up to 25 feet from water's edge if there is a vegetative buffer with slopes <6%. 	Use Permitted	Use Prohibited	Limited Use <ul style="list-style-type: none"> Spot treatment only within 50 feet of non-targeted woodlands or under canopy of desired woody plants. Do not apply over canopy in non-targeted areas. Avoid direct or indirect application to non-target plants or soil.
Clopyralid. ¹³ Thistles, yellow starthistle, knapweeds, oxeye daisy. Many broadleaf and woody species susceptible. Transline is labeled for terrestrial applications. Do not apply in or near surface water. Do not contaminate water used for irrigation or domestic purposes.	Use Prohibited	Use Prohibited <ul style="list-style-type: none"> Within 50 feet of water's edge. Exception: Wicking applications may occur within 50 feet, if allowed by the label. 	Same as SZ	Limited Use <ul style="list-style-type: none"> Hand application only. Broadcast application prohibited. 	Use Prohibited	Limited Use <ul style="list-style-type: none"> Spot treatment only within 50 feet of non-targeted woodlands. Under canopy of desired woody plants, spot apply to foliage of target plants and avoid direct or indirect application to non-target plants or soil
Dicamba. ¹⁴ Houndstongue, knapweeds, oxeye daisy, leafy spurge, tansy ragwort, yellow starthistle. Some broadleaf, brush, vines susceptible Vanquish and Banvel are labeled for upland sites and non-irrigation ditchbanks	Use Prohibited	Use Prohibited <ul style="list-style-type: none"> Within 50 feet of water's edge. Exception: Wicking applications may occur within 50 feet, if allowed by the label. 	Same as SZ	Limited Use <ul style="list-style-type: none"> Hand application only. Broadcast application prohibited. 	Use Prohibited	Limited Use <ul style="list-style-type: none"> Spot treatment only within 50 feet of non-targeted woodlands. Do not use within 3 times the dripline of trees and shrubs (conifers especially sensitive). Avoid direct or indirect application to non-target plants or soil.

*Draft Record of Decision
for Invasive Plant Management*

Management Zone. ¹						
	Aquatic Zone (AZ) includes ponded or slow waters that support aquatic plants (i.e. purple loosestrife). ²	Streamside Zone (SZ). ³ includes perennial and intermittent stream riparian areas.	Wetland Zone (WZ) are the seasonal and permanent wetlands	Groundwater Vulnerable Zone (GVZ). ⁴ the shallow groundwater beneath permeable soils; most often riparian areas. ⁵	Wellhead Protection Zone (WPZ). ⁶ is a 50 foot radius around an underground developed and functioning source of drinking water.	Woodland Zone (WDZ) includes hardwood draws, stands of conifers, stands of juniper, aspen groves, and riparian forest stands. Saltcedar areas are not considered woodlands.
Fluroxypyr ¹⁵ Common mullein, field bindweed, leafy spurge, musk thistle, black henbane Labeled for use in pine plantations, rangeland and non-cropland areas. Do not apply directly to water, avoid drift or run-off. Hazardous to aquatic organisms. Vista Specialty Herbicide and Vista XRT are labeled for the control of broadleaf weeds in rangeland, and grazed areas as well as for the control of woody brush.	Use Prohibited	Use Prohibited	Use Prohibited	Limited Use <ul style="list-style-type: none"> Hand application only. Broadcast application prohibited. 	Use Prohibited	Limited Use <ul style="list-style-type: none"> Spot treatment only within 50 feet of woodlands. Under canopy of desired woody plants, spot apply to foliage of target plants and avoid direct or indirect application to non-target plants or soil.
Glyphosate ¹⁶ Purple loosestrife, field bindweed, yellow starthistle, thistles, cheatgrass, toadflax. Glyphosate does not work on underwater plants such as Eurasian watermilfoil. Broad spectrum. Accord, Glypro, and Rodeo are labeled for certain aquatic weed control applications. The other products are for terrestrial applications, including ditch banks, and dry ditch or canal bottoms.	Use Permitted <ul style="list-style-type: none"> Aquatic formulations only Consult with Fisheries Specialist. Use Prohibited Non-aquatic formulations	Limited Use <ul style="list-style-type: none"> Use only formulations approved for use in or near water (i.e. Glypro, Rodeo). Spot treat target plants only within riparian area to avoid injury to non-target riparian plants. Use Prohibited Non-aquatic formulations	Same as SZ	Use Permitted	Use Permitted <ul style="list-style-type: none"> Use only formulations approved for use in or near water 	Limited Use <ul style="list-style-type: none"> Spot treatment only within 50 feet of non-targeted woodlands or under canopy of desired woody plants. Avoid direct or indirect application to non-target plants or soil.

*Medicine Bow – Routt National Forests
and Thunder Basin National Grassland*

Management Zone. ¹						
	Aquatic Zone (AZ) includes ponded or slow waters that support aquatic plants (i.e. purple loosestrife). ²	Streamside Zone (SZ). ³ includes perennial and intermittent stream riparian areas.	Wetland Zone (WZ) are the seasonal and permanent wetlands	Groundwater Vulnerable Zone (GVZ). ⁴ the shallow groundwater beneath permeable soils; most often riparian areas... ⁵	Wellhead Protection Zone (WPZ). ⁶ is a 50 foot radius around an underground developed and functioning source of drinking water.	Woodland Zone (WDZ) includes hardwood draws, stands of conifers, stands of juniper, aspen groves, and riparian forest stands. Saltcedar areas are not considered woodlands.
Hexazinone Cheatgrass, oxeye daisy, yellow starthistle, thistles. Broad spectrum control with some selectivity for conifers. Velpar and Pronone are labeled for terrestrial applications.	Use Prohibited	Use Prohibited • Within 50 feet of water's edge. Exception: Wicking applications may occur within 50 feet	Same as SZ	Limited Use • Hand application only. Broadcast application prohibited.	Use Prohibited	Limited Use • Follow Label direction in and near conifers. • Spot treatment only within 50 feet of non-targeted woodlands or under canopy of desired woody plants. Avoid direct or indirect application to non-target plants or soil.
Imazapic ¹⁷ Cheatgrass, leafy spurge, toadflax. Some broadleaf plants and grasses susceptible. Plateau is labeled for terrestrial use only. Do not apply near water.	Use Prohibited	Limited Use • Maximum of 0.188 lb a.e./ac. • Allowed up to 5 feet from water's edge if there is a vegetative buffer that has slopes <6%	Same as SZ	Limited Use • Maximum of 0.188 lb a.e./ac. • Exception: No slope limitations	Use Prohibited	Limited Use • When making fall applications, potential injury to tree and brush species from foliar contact may be minimized by making the application after the leaves have begun to senesce (fall color) or after leaf drop. Conifers are generally tolerant to fall applications. Applications in and around tree and brush species will be made at the recommended timing for the target weed species.

*Draft Record of Decision
for Invasive Plant Management*

Management Zone. ¹						
	Aquatic Zone (AZ) includes ponded or slow waters that support aquatic plants (i.e. purple loosestrife). ²	Streamside Zone (SZ). ³ includes perennial and intermittent stream riparian areas.	Wetland Zone (WZ) are the seasonal and permanent wetlands	Groundwater Vulnerable Zone (GVZ). ⁴ the shallow groundwater beneath permeable soils; most often riparian areas... ⁵	Wellhead Protection Zone (WPZ). ⁶ is a 50 foot radius around an underground developed and functioning source of drinking water.	Woodland Zone (WDZ) includes hardwood draws, stands of conifers, stands of juniper, aspen groves, and riparian forest stands. Saltcedar areas are not considered woodlands.
Imazapyr. ¹⁸ Saltcedar, purple loosestrife, dyers woad, field bindweed. Imazapyr does not work on underwater plants such as Eurasian watermilfoil. Broad spectrum. Arsenal is labeled for uplands, non-tidal wetlands where surface water is not present, non-irrigation ditchbanks, and ditchbottoms where only isolated puddles of surface water occur.	Use Permitted • Consult with Fisheries Specialist.	Limited Use • Use of Habitat or Arsenal on cut stump or hand spraying salt cedar may come into contact with surface water per label instruction. • For all other species, use of Imazapyr is allowed up to 5 feet from water's edge if there is a vegetative buffer that has slopes <6%.	Same as SZ for Imazapyr	Use Permitted • Exception: No slope limitations	Use Prohibited	Limited Use • Spot treatment only within 50 feet of non-targeted woodlands or under canopy of desired woody plants. Avoid direct or indirect application to non-target plants or soil.
Metsulfuron methyl. ¹⁹ Houndstongue, thistle, sulfur cinquefoil, dyers woad, purple loosestrife, common tansy, hoary cress. Escort is labeled for Terrestrial applications. Escort can be applied to floodplains, terrestrial areas of deltas, and drained areas of low-lying areas where there may be isolated puddles.	Use Prohibited	Use Prohibited • Within 50 feet of water's edge. Exception: Wicking applications may occur within 50 feet.	Same as SZ	Use Prohibited	Use Prohibited	Limited Use • Spot treatment only within 50 feet of woodlands or under canopy of desired woody plants. Do not apply over canopy in non-targeted areas. Avoid direct or indirect application to non-target plants or soil.

*Medicine Bow – Routt National Forests
and Thunder Basin National Grassland*

Management Zone. ¹						
	Aquatic Zone (AZ) includes ponded or slow waters that support aquatic plants (i.e. purple loosestrife). ²	Streamside Zone (SZ). ³ includes perennial and intermittent stream riparian areas.	Wetland Zone (WZ) are the seasonal and permanent wetlands	Groundwater Vulnerable Zone (GVZ). ⁴ the shallow groundwater beneath permeable soils; most often riparian areas. ⁵	Wellhead Protection Zone (WPZ). ⁶ is a 50 foot radius around an underground developed and functioning source of drinking water.	Woodland Zone (WDZ) includes hardwood draws, stands of conifers, stands of juniper, aspen groves, and riparian forest stands. Saltcedar areas are not considered woodlands.
Picloram. ²⁰ Thistles, yellow starthistle, knapweeds, common tansy, toadflax, leafy spurge. Grasses are tolerant. Tordon is labeled for terrestrial applications. Should not be used where conditions favor off-site movement due to leaching or run-off.	Use Prohibited	Use Prohibited • Within 50 feet of water's edge. Exception: Wicking applications may occur within 50 feet, if allowed by the label.	Same as SZ	Limited Use • Hand application only. Broadcast application prohibited.	Use Prohibited	Limited Use • Spot treatment only within 50 feet of non-targeted woodlands or under canopy of desired woody plants, especially within 3 times the dripline of trees and shrubs. Avoid direct or indirect application to non-target plants or soil.
Sulfometuron methyl. ²¹ • Spot treatment only with hand application methods. Cheatgrass, hoary cress, oxeye daisy, musk thistle. Broad spectrum. Oust: - Do not apply near open water.	Use Prohibited • Broadcast application prohibited within 100 feet of AZs. • Aerial application prohibited within 1500 feet of AZs. ²²	Limited Use • Allowed up to 25 feet from water's edge if there is a vegetative buffer with slopes <6%.	Same as SZ	Use Permitted	Use Prohibited	Limited Use • Spot treatment only within 50 feet of woodlands or under canopy of desired woody plants. Do not apply over canopy in non-targeted areas. Avoid direct or indirect application to non-target plants or soil.

*Draft Record of Decision
for Invasive Plant Management*

Management Zone. ¹						
	Aquatic Zone (AZ) includes ponded or slow waters that support aquatic plants (i.e. purple loosestrife). ²	Streamside Zone (SZ). ³ includes perennial and intermittent stream riparian areas.	Wetland Zone (WZ) are the seasonal and permanent wetlands	Groundwater Vulnerable Zone (GVZ). ⁴ the shallow groundwater beneath permeable soils; most often riparian areas... ⁵	Wellhead Protection Zone (WPZ). ⁶ is a 50 foot radius around an underground developed and functioning source of drinking water.	Woodland Zone (WDZ) includes hardwood draws, stands of conifers, stands of juniper, aspen groves, and riparian forest stands. Saltcedar areas are not considered woodlands.
Triclopyr. ²³ <ul style="list-style-type: none"> Do not use high application rates in order to avoid potential hazards to birds and mammals The use of Triclopyr is limited to selective application techniques only (e.g., spot spraying, wiping, basal bark, cut stump, injection). No aerial spraying. Purple loosestrife, sulfur cinquefoil, knapweed, oxeye daisy, thistle. Woody, some broadleaf & root-sprouting species are susceptible. Grasses are tolerant. Renovate3 is labeled for aquatic applications. Garlon 3A, Garlon 4, and Pathfinder II is labeled for Upland sites, non-irrigation ditchbanks, and seasonally dry wetlands, floodplains, deltas, and transition areas between uplands and wetlands. Do not apply directly to water.	Use Permitted <ul style="list-style-type: none"> Aquatic formulations only Consult with Fisheries Specialist. Use Prohibited <ul style="list-style-type: none"> Non-aquatic formulations 	Limited Use <ul style="list-style-type: none"> Use only formulations approved for use in or near water. Aquatic labeled formulations can be applied up to the water's edge (without direct contact to the water). Use Prohibited <ul style="list-style-type: none"> Non-aquatic formulations 	Same as SZ	Use Permitted	Use Prohibited	Limited Use <ul style="list-style-type: none"> Spot treatment only within 50 feet of non-targeted woodlands or under canopy of desired woody plants. Avoid direct or indirect application to non-target plants or soil.

¹ Follow label direction as it pertains to use in irrigation ditches.

² AZs. For ponds with heavy weed infestation, partial treatments may be necessary to prevent oxygen depletion and possible fish suffocation associated with decaying vegetation.

³ SZs. Aminopyralid, and formulations of 2,4-D amine, glyphosate (i.e., Glypro and Rodeo), and triclopyr (i.e. Renovate 3) approved for use in or near water are compatible for use in SZs and can be applied to the water's edge. Glyphosate is injurious to some desired riparian plants, so it must be applied by spot treatments to target plants within a riparian area. Where 5 foot setbacks from water's edge are in place, alternative treatments may include use of permitted herbicides, wick applications, biocontrols, mechanical options, and/or herbivory by goats or sheep.

⁴ Most herbicide groundwater contamination results from "point sources." Point source contaminations include spills or leaks at storage and handling facilities, improperly discarding containers, and rinsing equipment in loading and handling areas, often times into adjacent drainage ditches. Point sources are characterized by discrete, unidentifiable locations discharging relatively high local concentrations. These contaminations can be avoided through proper calibration, mixing, and cleaning of equipment. Non-point source groundwater contaminations of herbicides are relatively uncommon. They can occur, however, when a mobile herbicide is applied in areas with a shallow water table. In this situation, the choice of an appropriate herbicide or alternative control strategy can prevent contamination of the water source. Water tables can shift seasonally and annually; therefore, the depth to water table can be monitored prior to application of a prohibited or limited herbicide within a GVZ. For example, areas that customarily have high water tables early in the growing season may be suitable for herbicide treatment by the fall if preceding precipitation is low. Glyphosate and amine formulations of 2,4-D and triclopyr are currently labeled for aquatic use and will be the materials used within designated buffer zones along streams and bodies of water. Imazapic, imazapyr, and triclopyr can be used in buffer zones as long as they are not directly applied to water.

⁵ Most of the GVZs are found along SZs and WZs. Use the same chemical prohibitions, limitations, and uses listed under the SZs and WZs apply to GVZs with the listed exceptions by herbicide.

⁶ WPZs. Biological controls, herbivory, or mechanical options will be emphasized where feasible and effective.

⁷ AZs. These formulations labeled for aquatic use target broadleaf plants (dicots) such as purple loosestrife. Most native aquatic plants are monocots and not susceptible to these chemicals.

⁸ Although applications by other means are prohibited or limited within 5- feet of water in SZs, wicking application of prohibited herbicides is allowed up to the water's edge due to direct foliage treatment with no drifting or direct application to soil, if allowed by the label.

⁹ The more restrictive setback distance in WZs than SZs reflects the persistence of 2,4-D and chloresulfuron in anaerobic conditions, which are more likely to exist in lentic water systems (wetlands) and wetland soils than in lotic (riverine) environments. GWZs: Only formulations approved for in and near water (such as 2, 4-D and glyphosate) will be approved for use within a WPZ. These chemicals have low to intermediate leaching potential.

¹⁰ Vegetative buffer is an area with good vegetative ground cover. Badlands or other low cover areas with bare ground will not be considered as a vegetative buffer.

¹¹ *SZs. Limited Herbicides.* Limitations are imposed based on persistence, transportation pathways, application rates, modes of chemical degradation, and environmental properties of various formulations. The use of aminopyralid is effective on a narrow spectrum of plants (especially knapweeds and thistles) and can generally be used in SZs where standing water does not occur.

¹² *SZs. Limited Herbicides.* Limitations are imposed based on persistence, transportation pathways, application rates, modes of chemical degradation, and environmental properties of various formulations. Use of chlorsulfuron must avoid flooded areas and anaerobic conditions, which commonly occur in saturated soils. The risk of flooding along some perennial streams is seasonal; therefore, use of chlorsulfuron may be restricted temporally during periods when there is a high probability of flooding. The more restrictive setback distance in WZs than SZs reflects the persistence of 2,4-D and chlorsulfuron in anaerobic conditions, which are more likely to exist in lentic water systems (wetlands) and wetland soils than in lotic (riverine) environments.

¹³ *SZs: Prohibited Herbicides.* Herbicides that are prohibited within 50 feet of water are very mobile with generally moderate persistence. Triclopyr targets many of the same noxious weeds as clopyralid and has been formulated for use near water. Consequently triclopyr is a more acceptable alternative than clopyralid or metsulfuron methyl in a SZ.

¹⁴ *SZs: Prohibited Herbicides.* Herbicides that are prohibited within 50 feet of water are very mobile with generally moderate persistence. Even though dicamba has low persistence, it is very mobile, easily leached, and breaks down slowly in water or in water-saturated soil. The weeds which dicamba targets generally do not occur in wetland or riparian settings. Therefore, the prohibition of dicamba has little bearing on management options. WZs.: Dicamba can injure woody plants by being exuded through weed roots and being taken up by trees and shrubs within three times their drip lines.

¹⁵ Fluroxypyr is toxic to fish. Leachability is moderate.

¹⁶ GWZs. Only chemicals with a low to intermediate leaching potential will be approved for use within a WPZ.

¹⁷ *SZs. Limited Herbicides.* Limitations are imposed based on persistence, transportation pathways, application rates, modes of chemical degradation, and environmental properties of various formulations. The use of imazapic is desirable because it acts on a narrow spectrum of plants and is generally non-injurious to non-target forbs at low application rates and when applied after seed-set has occurred. Furthermore, imazapic is rapidly photodegraded by sunlight in surface waters. Imazapic and imazapyr are limited to reaches where a well vegetated buffer zone exists and grounds slopes are less than 6 percent imazapic is 0.188 lb acid equivalent/acre, based on studies that demonstrate limited mobility at this and lower application rates (BASF Corporation, 2006, p. 4). The slope restrictions on imazapic and imazapyr do not apply within a GVZ because physical translocation of soil-adsorbed chemicals will not affect the groundwater.

¹⁸ *SZs. Limited Herbicides.* Limitations are imposed based on persistence, transportation pathways, application rates, modes of chemical degradation, and environmental properties of various formulations. Imazapic and imazapyr are limited to reaches where a well vegetated buffer zone exists and grounds slopes are less than 6 percent between the application site and surface water. These requirements are imposed to keep these herbicides from entering surface water via runoff from overland flow. Imazapyr may be transported on eroded soil particles. Setback and vegetation buffer limitations have been applied to minimize soil transport when imazapyr is applied near water. The slope restrictions on imazapic and imazapyr do not apply within a GVZ because physical translocation of soil-adsorbed chemicals will not affect the groundwater.

¹⁹ *SZs: Prohibited Herbicides.* Herbicides that are prohibited within 50 feet of water are very mobile with generally moderate persistence. Metsulfuron methyl is slow to break down in surface water, especially alkaline waters. Triclopyr is a more acceptable alternative than clopyralid or metsulfuron methyl in a SZ.

²⁰ WZs. Picloram can injure woody plants by being exuded through weed roots and being taken up by trees and shrubs within three times their drip lines.

²¹ SZs. Sulfometuron methyl limitations are designed to prevent transportation to surface water by overland flow.

²² USDI BLM 2005

²³ SZs: *Prohibited herbicides*. Herbicides that are prohibited within 50 feet of water are very mobile with generally moderate persistence. Triclopyr targets many of the same noxious weeds as clopyralid and has been formulated for use near water. Consequently, triclopyr is a more acceptable alternative than clopyralid or metsulfuron methyl in a SZ.